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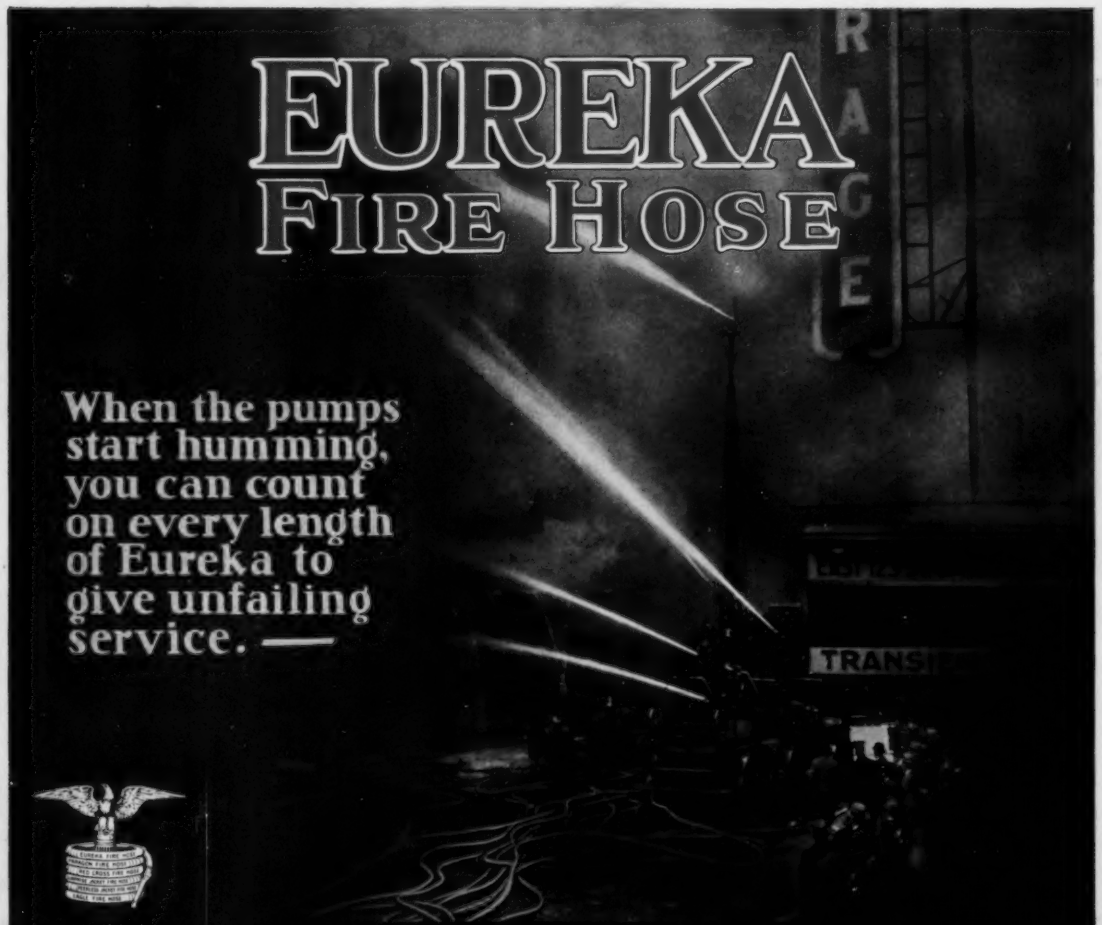
The Journal of the Fire Protection Profession

JANUARY 8, 1930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A Consolidation of FIRE AND WATER ENGINEERING and THE FIRE ENGINEER

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A Matter of Mind

¶ Now is a good time of the year to put the following little thought in your pipe and smoke it thoroughly:

IF you think you are beaten, you are;
If you think you dare not, you don't;
If you think you'd like to win, but you can't,
It's almost a "cinch" you won't;
If you think you'll lose, you've lost,
For out in the world you'll find
Success begins with a fellow's will —
It's all in the state of mind.

FULL many a race is lost
Ere even a race is run,
And many a coward fails
Ere even his work's begun.
Think big and your deeds will grow,
Think small and you fall behind,
Think that you can, and you will;
It's all in the state of mind.

IF you think you are outclassed, you are;
You've got to think high to rise;
You've got to be sure of yourself before
You can ever win a prize.
Life's battle doesn't always go
To the stronger or faster man;
But sooner or later, the man who wins
Is the fellow who thinks he can."

The Publishers

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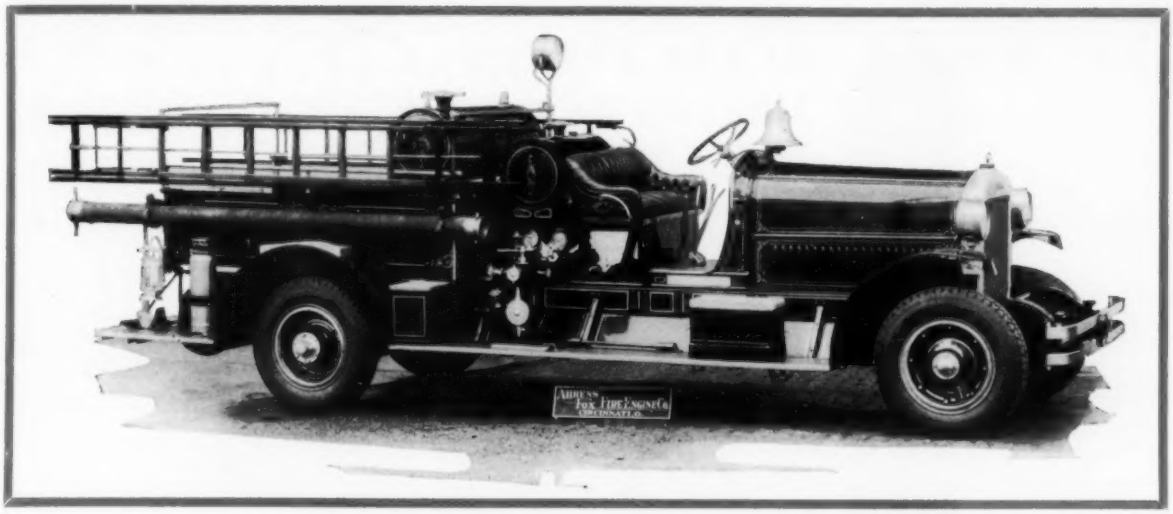

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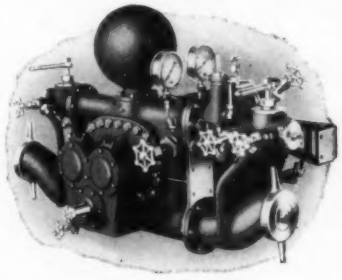

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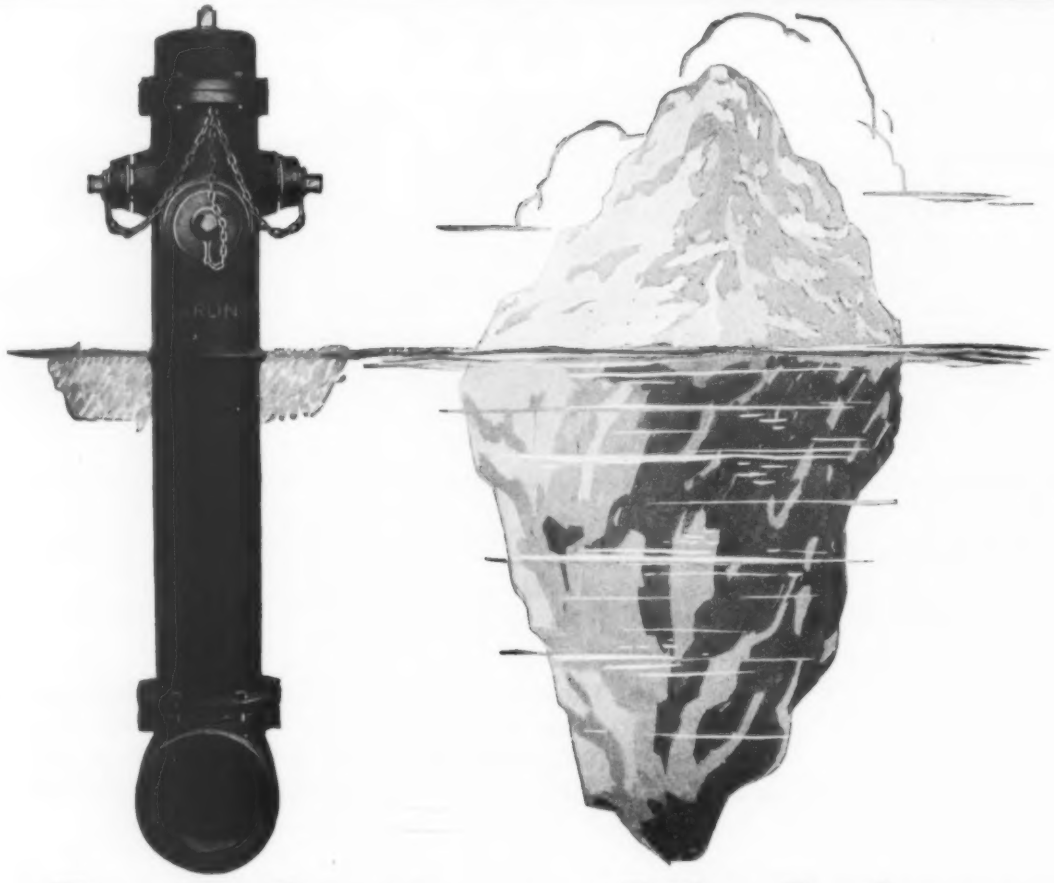

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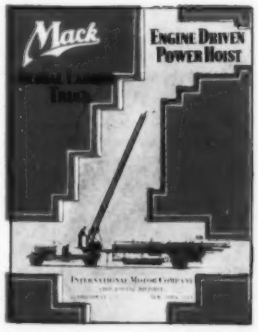

Write for this attractively illustrated folder on the new Mack Aerial Ladder Truck and Engine-Driven Power Hoist.

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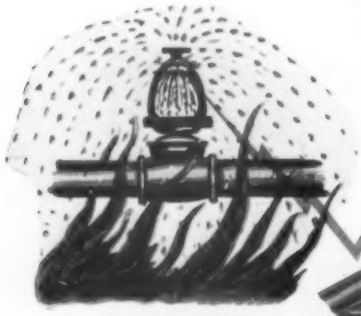

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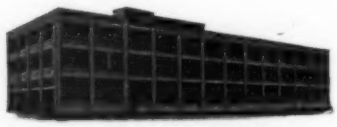

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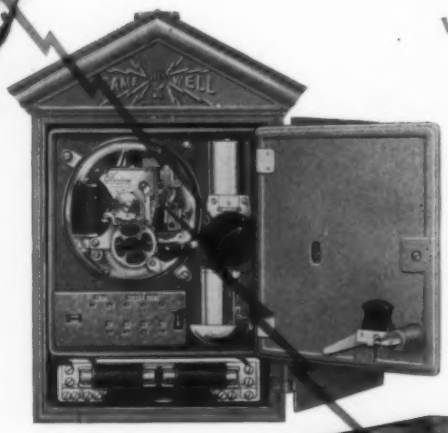

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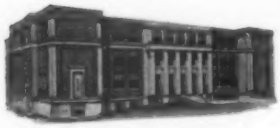

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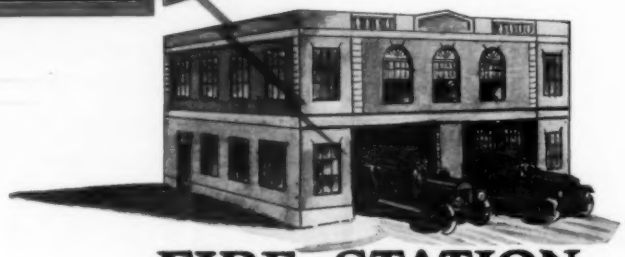

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Fire Chiefs and Superintendents of Fire Alarm in many cities have already recognized the value of such a connection and have recommended it to the business houses, theatres, institutions, factories, stores and other types of sprinkler protected property. Among these cities are:

Fresno, Calif.	Santa Ana, Calif.	Denver, Colo.
Columbus, Ind.	Huntington, Ind.	Maysville, Ky.
Lewiston, Me.	Lawrence, Mass.	Lynn, Mass.
Gardner, Mass.	Binghamton, N. Y.	White Plains, N. Y.
Asheville, N. C.	Burlington, N. C.	Charlotte, N. C.
Cleveland, Ohio	Bethlehem, Pa.	Wichita Falls, Texas
Burlington, Vt.	Newport News, Va.	Norfolk, Va.
	Columbus, Ga.	

In Denver alone, there are 100 or more of these installations, many of which have been in service for as long as ten years.

Insurance interests have also recognized this *Sprinkler Watchman*, and have recommended its installation in various sections of the country; made allowances in rates and in some cases have even allowed factories to dispense with watchmen.

(If you would like a wiring diagram and further details on the *Sprinkler Watchman*, write to our nearest office.)

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The Journal of the Fire Protection Profession

VOLUME LXXXIII JANUARY 8, 1930 NUMBER 1

When Is a Confession of Arson Admissible as Evidence?

An Important Decision by Judge of Higher Court on This Subject—Other Legal Matters of Interest to Fire Departments

By LEO T. PARKER, Attorney-at-Law

GENERALLY speaking, the Court will not reverse a lower Court's conviction of arson on mere technicalities. However, if the conviction is accomplished in violation to some law clearly defining the rights of persons accused of committing the crime of arson the situation is quite different.

For example, in Faulk vs. State, 123 So. 104, it was disclosed that a State law provided that the burning of a barn is arson in the second degree. The same law provided punishment for burning dwellings and other buildings and in the succeeding paragraph specified that arson consisted of burning a building valued at more than $500.

A person named Faulk who was convicted of arson for burning a barn appealed to the higher Court on the contention that the State law required the barn to be valued at $500.

However, the higher Court refused to interpret the law in this manner, saying:

"A barn is a building of distinctive character, and known as such to everyone, and, as stated, to willfully set fire to or burn a barn renders the person or persons committing such act guilty of arson in the second degree, and when such act affirmatively appears, under the requires rules of evidence, the crime is complete, and the contents or value thereof is wholly immaterial and in no sense an element or ingredient of the offense and need not be alleged, nor is proof thereof upon the trial admissible . . . The provisions as to value, and the curtilage of a dwelling house contained in the same law section have obviously no reference to a barn, but refer only to the buildings named therein just before these provisions."

On the other hand, it is important to know that the higher Court reversed the lower Court's conviction because the Judge in the lower Court refused to permit Faulk to question the person who had testified that he had filed a written confession to the crime. In commenting upon this phase of the law the Court said:

"The established doctrine is, that all confessions are presumptively involuntary and inadmissible; and that it is incumbent on the State to show, prima facie, that a confession was freely and voluntarily made, before it can be admissible in evidence to the jury. . . . Whenever the admissibility of any evidence depends on extraneous facts, both parties should be allowed to introduce proof as to such facts. In determining whether the confession proceeded from the volition of the accused, or from an influence improperly exerted, the judge should hear and determine the question of admissibility. . . . also upon the proof which the defendant may introduce, in order that he may not be prejudiced by the admission of illegal evidence."

Right of Fire Department to Install Fire Preventive Equipment

Generally speaking, a property owner cannot prevent a municipality from installing necessary or useful fire preventive equipment on the sidewalk in front of his property.

For instance, in Centebar vs. Selectmen of Watertown, 167 N. E. 303, an owner of an apartment building sued to enjoin the selectmen and the inspector of poles and wires of the city from erecting a fire-alarm cable box in the public sidewalk which adjoins his real estate.

During the trial it was proved that the municipality was installing a new underground fire-alarm and signal system. The fire-alarm cable boxes being installed along the street was an essential part of the new system. The property owner contended that installation of the box in the selected location, at the outer edge of the sidewalk directly in front of the entrance to the apartment building, would seriously interfere with and hamper the access of his tenants to and from automobiles and that the installation violated his constitutional rights.

Notwithstanding these contentions, the Court held the municipality may legally install the alarm-box, stating the following important law:

"The rights of the public in the highway, including the sidewalk, in front of the premises, include the right to lay therein the cable of a fire-alarm signal system and to erect, equip and maintain therein the cable boxes incidental thereto. Even if the public right in the highway is an easement only, the erection of such a fire-alarm signal system is not an additional servitude. . . . Obviously the proposed cable box will not interfere at all with passage between the sidewalk and the premises. . . . According to the facts, the erection of the cable box as proposed will be a reasonable exercise of the public right. Hence the plaintiff's right of access will not be invaded, and neither Article 10 of the Declaration of Rights, part 1, of the Constitution of the Commonwealth nor the Fourteenth Amendment to the Constitution of the United States, will be violated. There is no basis for a contention that any private right of the plaintiff

> "The established doctrine is that all confessions are presumptively involuntary and inadmissible; and that it is incumbent in the State to show, prima facie, that a confession was freely and voluntarily made, before it can be admissible in evidence to the jury."

(property owner) other than his right of access will be interfered with by the erection of the cable box as proposed."

Illegal to Attach Money in Hands of Public Officer

It is important to know that the majority of State legislatures have enacted laws prohibiting garnishment or attachmen of funds in the hands of public officials.

In B. B. Wilson Company vs. Van Diver, 18 S. W. (2d) 308, a contractor's creditor had an attachment issued and served upon a duly appointed public officer, auditor of public accounts, and State treasurer. The purpose of the attachment was to attach in the hands of these State officials certain funds which were due the contractor in payment for work he had done on State highways under contracts with the State highway commission.

However, the higher Court sustained the lower Court's decision that the attachment proceedings are illegal, saying:

"It has been repeatedly decided that, in the absence of a law authorizing it, the State cannot be made a party defendant or garnishee, and is not suable in her own Courts; 'that parties will not be allowed to evade this inhibition by ignoring the State in their suits, and proceeding directly against the public officer having the custody of the moneys sought to be reached.' . . . It has long been the settled rule in this State that the fees, salary, or compensation of a public officer, in the hands of the disbursing officer of the State, are not subject to garnishment or attachment. . . . In support of this rule two reasons are assigned: (1) the State is entitled to the free and unhampered labor of its officers, and, if they were permitted to be harassed by attachment or garnishment proceedings, it would interfere with their efficiency and seriously cripple the public service; (2) the State cannot be sued."

City Not Liable for Injury Effected in Its Governmental Capacity

The law is well established that a city is not liable for injuries arising from performance of its governmental functions. Moreover, this law still is effective although the injury is caused by means not exclusively used in a governmental capacity, as by the fire department.

For illustration, in O'Donnell vs. Groton, 144 Atl. 468, it was disclosed that a workman filed suit against a municipality to recover damages because of injuries suffered from the explosion of a tank in which compressed air was to be stored for use in blowing a whistle as a fire alarm signal. The tank consisted of an old steam boiler, which was being made over into a receptacle under the direction of the general superintendent of the water and electrical department of the city, and the injured person was employed to weld to the ends of the boiler circular steel plates to seal them against the escape of the air. The workman had completed the welding and, while he was still in the room, air under pressure was allowed to enter the tank for the purpose of testing it, through a two-inch pipe from a smaller tank on the floor above, where it was maintained at an average pressure of 150 pounds to the square inch.

He claimed at the trial that the explosion was due to the fact that the employes of the city permitted air to enter the tank at a greater pressure than it would resist, that they had weakened the tank by removing the tubes and stay rods which had been in it, that they failed to warn him of the dangers of the test as made, and that the tank was not exclusively used by the fire department.

However, the Court held the city not liable, saying:

"It has become a settled principle of our law that the preservation of the property in a city from damage and exposure to danger from fire, and the establishment and maintenance of a fire department, when assumed by a municipal corporation under its charter, are a part of its public or governmental duties and for negligence in the performance of such duties it is immune from liability. . . . No claim is made that the maintenance of the whistle as a fire alarm by the defendant (city) was not a proper and reasonable means to adopt in the performance of its duty in putting out fires. The fact that the tank was not being used as a part of its fire prevention system, but was still in process of adaptation for such use, affords no ground of exception to the rule of governmental immunity, for that rule includes the construction and maintenance of fire equipment as well as its use for fire prevention."

Even the Exclusive Sections Have Rum Tanks

Persons living in an exclusive residential section of Hollywood, Cal., were badly shaken by the force of an explosion when a 150-gallon still blew up. The fire that followed was brought under control before it spread throughout the building. Luckily the damage was kept below $8,000.

Court Upholds Convictions of Public Officer

Generally speaking, any municipal public office created in accordance with the provisions of a State law or the city charter is valid.

For instance, in Cason vs. McLeod, 148 S. E. 584, it was disclosed that a public officer was arrested for being drunk and was convicted by the "city recorder."

The former appealed to the higher Court to reverse the verdict, contending that the office of city recorder is invalid and not properly authorized, in that there is no ordinance of the city creating a recorder's court of the office of recorder, as provided in the charter of the city.

During the trial it was admitted that the mayor and council of the city had not passed any ordinance establishing the office of city recorder, but had passed a resolution appointing a man named McCorkle as city recorder. This was the only record showing the establishment of the office of recorder.

It was also shown that a State law which created the city charter, provided:

"That the mayor and council of the city may, wherever in their judgment they see fit, create the office of city recorder for said city and to elect some upright and intelligent person reasonably skilled in the law, resident of said city, to perform the duties of that office and to fix at not more than six hundred dollars per annum his compensation therefor. Said recorder may be elected at any time that in the judgment of mayor and council his services may be necessary or desirable, and he shall hold his office for a term of one year, or until the qualification of the mayor and council following the next city election, and until his successor is elected and qualified."

In view of this law the higher Court reversed the lower Court's decision and held the public officer's conviction to be legal, stating the following important law:

"In view of the provisions of the charter of the city, providing for the creation of the office of city recorder, for the election of such officer, prescribing his qualifications, fixing the maximum salary which can be paid him, and the term for which he should hold office, the resolution set out above, by which McCorkle was unanimously elected to such office at a salary of $25 per month, was sufficient to create the office of city recorder for said city, and to constitute said McCorkle city recorder, although said resolution and no other ordinance of the city expressly created such office. This being so, the conviction and sentence of the plaintiff by McCorkle as city recorder were not null and void. . . . No particular language is necessary to create an office, if the intent of the legislative body to create it is manifested by the language used. It is not necessary that the legislative body declare in express words that an office is created. The use of any language which shows the legislative intent to create the office is sufficient."

Fireman Held Entitled to Compensation for Injury

Usually, the Courts decide compensation litigations in favor of firemen, if it is possible with fairness to do so. Moreover, this is so although the physician's testimony is not strictly in favor of the firemen.

For instance, in Blair vs. Village of Coleraine, 225 N. W.

(*Continued on Page 36*)

Silk Mill Fires—Big Losses

High Value of Stock and Expensive Machinery Contribute to Heavy Damage by Fire—Suggested Methods for Handling Fires

Here's a Silk Mill Fire That Caused a Million Dollars Loss

The illustration shows all that was left of the Van Kirk Silk Mills at Paterson, N. J., following a fire. In this particular case the fire was believed to be of incendiary origin. At any rate, the plant was completely destroyed, as the illustration shows.

SILK mills involve many processes. The first one which represents a hazard is that of yarn dyeing. The yarn is first washed in preparation for dyeing. If blacks are dyed, they are usually weighted with bichloride of tin or other metallic salts to make them heavier, increase the closeness of texture and improve the feel. After dyeing the yarn is dried on frames to prevent its shrinking and again wound into skeins. The hazards in connection with these plants are chiefly due to the storage and use of chemicals, but usually well understood and guarded. Sulphur and sodium peroxide are used in bleaching. Picric acid is used as a dye. Nitric acid is sometimes used in making iron nitrates. There are also various dyestuffs, some of which may present a hazard. Where weighting is done it is important to ascertain how heavy the materials are loaded—as this constitutes a spontaneous combustion hazard in the goods, proportionately to the amount of loading.

In some dye works a complete soap factory will be found, but due to the high grade products, the hazards are mild, the raw stock consisting chiefly of glycerin and olive oil. Tin reclaiming (from weighting liquor) presents an ordinary furnace hazard and the use and storage of lime.

The silk as it comes from the dye works—and at this point artificial silk and sometimes mercerized cotton are introduced if they are used—is wound on bobbins which go into the shuttle of the loom. This forms the filler of the material. Organzine, used for the warp, is wound on the large wooden cylinder called the beam. This is set up from ten to twenty feet from the large frame where each thread is set in its proper order and each must be continuous and wind onto the beam so that in weaving, the longitudinal threads of the material will be even.

Weaving is the operation of producing cloth from threads and is performed on a loom. The essential parts of this machine are an arrangement for stretching the warp, a contrivance (harness) for raising each opposite strand of the warp and depressing the other half so as to open a space for the shuttle, which carries the weft, to pass through, and a contrivance for striking each weft thread up to the one previously thrown.

When fancy printed fabrics are produced, they are usually sent to the print works, where the designs are printed from copper rolls directly onto the cloth or upon the warp before weaving. Piece goods are calendered on large heated cylinders arranged like a wringer.

Hazards

The hazards of weaving mills and print works are mostly self-evident. Because of the great value of

the material handled, care must be taken to avoid unnecessary use of water or in any other manner to injure the stock of material present.

Harness dressing for oiling the harness of a loom consists of varnish, linseed oil, and bees-wax, usually prepared in small quantities over a gas plate. The number, arrangement and location of looms, as well as the overhead harness, are factors in facilitating the spread of fire. The method of heating calenders and other machines also add a hazard insofar as origin of fire is concerned.

Silk mills, because of the large amount of equipment needed in the production of silk, are usually comparatively large establishments. The older mills are built of brick and wood joist construction while some of the newer mills are concrete construction. Large open areas are characteristic of these mills, with the exception that chemicals are usually stored in well separated compartments. The stock of silk is also frequently kept in vaults which aids in keeping the fire loss down in the event of fire.

Some of the common causes of silk mill fires, as compiled by the National Fire Prevention Association, are given herewith. The records of 234 fires in silk plants, which exclude artificial silk, show the following causes: miscellaneous, 41; drying processes, 22; electrical equipment, 17; smoking, 17; lightning, 13; rubbish and sweepings, 12; unknown 44, and a variety of other miscellaneous causes making up the total of 234.

Fighting the Fire

Assuming that fire starts on one of the main floors, it is going to travel rapidly, due to the presence of light woodwork employed in some of the machines, as well as combustible harness. Unless sprinklers are available, and get into operation promptly, the chance of a large fire is very pronounced.

If one of the floors in such a building is well involved at the time of the arrival of the department, streams of good range are necessary. It may not be essential to use large diameter streams except where inflammable stock in large quantities is involved. But streams of good range are necessary in order to cover the large open areas represented in plants of this type.

The usual methods of handling other industrial fires apply here, namely, covering exposures, confining the fire, and extinguishing it.

Ventilation is performed in an effort to confine the fire to one part of the plant and make it possible for the men to enter the floors to do close work, where such is desirable.

Should fire reach chemical rooms, there will likely be considerable danger to men operating on the fire due to the generation of poisonous fumes. This applies particularly to nitric acid which throws off deadly gases. Picric acid will increase the intensity of the fire tremendously, and under certain conditions may explode. Sodium peroxide will contribute greatly to the intensity of the fire by furnishing oxygen to the blaze. Sulphur, on the other hand, will contribute to making close operation difficult by the generation of sulphur dioxide gas. Where the chemical room is involved, thorough ventilation must be provided, and care taken to protect the men in operating within the building.

Due to the rapid spread of fire in silk mills, it is usually wise to call more apparatus than is apparently needed at the time the fire is reached by the department. The record of silk mill fires involving the entire plant and completing the destruction of the establishment shows that a large proportion of such plants become fully involved despite the efforts of the department. This point should be borne in mind in operating at such a fire.

Four Die in Waste Paper Plant Fire

Four persons died and fourteen others were unaccounted for in a fire that destroyed the four-story plant in Baltimore, Md., occupied by the Thomas H. O'Connor Waste Paper Company. About fifty other employees were in the building at the time of the fire, but they escaped ahead of the rush of flames. The photographs shows the fire at its height.

Firemen Conduct Public School Drills

Excellent cooperation exists between the public schools of Glenrock, Wyo., and the fire department in conducting and supervising fire drills. Two members of the department are assigned to each school to take charge of the drills. The alarm is sounded without the teachers or pupils having any advance knowledge of the fact. A prize is awarded to the school that makes the best average times for these drills during the year.

At the beginning of the year, each teacher is given a plan of drills and instructions so that the information could be passed on to the children.

In conducting the drills, absolute silence is required. No one is permitted to leave the building on the run, but the children are urged to adapt themselves to a fast walk. The department plans in advance the exits that each of the classes is to use. Parents are very pleased that the fire department has taken time to supervise the fire drills in schools.

Chief H. B. Wood reports that the plan has worked out very well, and he urges that the scheme be tried out in other cities.

N. Y. Takes In Queens Department

A parade through the principal streets of Douglaston and Little Neck, in the Borough of Queens, New York, marked the end of the Queens volunteer department. It was absorbed by the fire department of New York City. The volunteer companies that formerly gave fire protection to these communities were organized in 1903.

Promotions Made in Boston—Four lieutenants were promoted to the rank of captain of the Boston Fire Department, and nine privates were advanced to lieutenants by Mayor Malcolm E. Nichols.

Telephone Sued for Fire Damage—The New England Telephone and Telegraph Company has been sued for $23,000 in superior court, Worcester, Mass., to recover for the loss of a home in Bolton which the plaintiffs allege was destroyed because of delay in putting through a telephone call to the Hudson Fire Department.

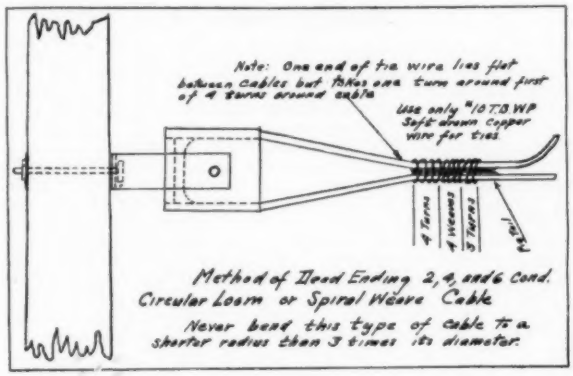
Problems of Span and Sag in Erection of Fire Alarm System Cables

Amount of Sag in Relation to Length of Span—Element of Sleet and Wind Must Be Considered — Interesting Figures

By H. I. TURNER*

THE problems dealt with in the following paper are important ones in connection with the installation of municipal fire alarm telegraph systems, especially in climates where severe Winter weather is experienced, with storms of heavy sleet and snow:

There are many situations where 2, 4 and 6-conductor circular loom cable can be erected without a supporting messenger wire in place of the same number of separate conductors at a considerable saving in labor and pole space. It is becoming increasingly


Note: One end of the wire lies flat between cables but takes one turn around first of 4 turns around cable
Use only #10 TBWP Soft drawn copper wire for ties
4 Turns
4 Weaves
3 Turns
Method of Dead Ending 2, 4, and 6 Cond. Circular Loom or Spiral Weave Cable
Never bend this type of cable to a shorter radius than 3 times its diameter.

common to use such cables in fire alarm and police telegraph systems. It is, however, very necessary that the cable be properly erected. I intend to present herewith information on the proper erection of 4/c cable on poles without a messenger support. The method by which the problem is attacked applies equally well to cable of any other size, but it should not be assumed that the figures themselves presented herewith are in any way applicable to anything but 4/c cable. In fire alarm and police telegraph use this I believe is by far the most common size to be installed without messenger supports.

It is plain to anyone that the mechanical tension in a piece of wire suspended between two supports is determined by two factors, one of which is the distance between the supporting insulators, and the other of which is the amount of sag in the wire. That the National Board of Fire Underwriters considers that the tension in aerial conductors requires consideration is evident from paragraph A of section 4 of the Regulations of the National Board relative to the Installation of Municipal Fire Alarm Systems. This paragraph states that single wires shall not be smaller than No. 10 hard drawn, copper for spans up to 150 feet, and the cross section shall be increased in the ratio of the squares of the lengths of the span in cases where the span exceeds 150 feet. This simply means that the National Board intends that aerial conductors shall not be erected that do not have sufficient tensile strength to withstand the loads impressed upon them. That they do not mention circular loom cable does not mean that the erection of the same may properly be carried out without at least as much regard for the tensile stresses existing within the cable.

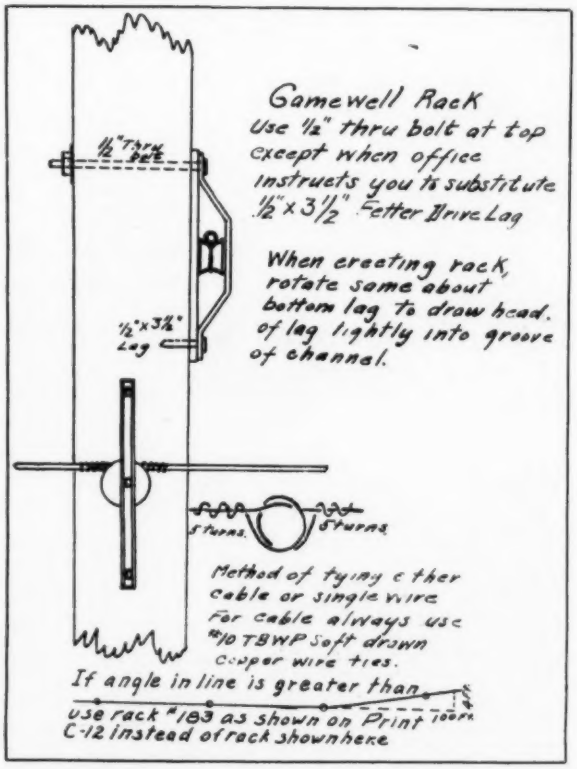
Where Supports are at Different Levels

It is possible to furnish data for the proper tension and sag of cable where two insulator supports are not on the same level, but so many instances occur where the cable is supported at each end by insulator at about the same elevation that it is unnecessary in computing safe sag and tension allowances in circular loom cable to go further than to figure the cases where both supports are at the same elevation. Furthermore if special cases are encountered where circular loom cable is erected between supports which have different levels and if the span is in excess of 100 feet the tension can be accurately determined by means of spring scales such as the "Matthews Strainometer." In the great majority of installations, however, so much time would be consumed in actually measuring the tension in each span that it is far more practical to carry in mind an idea as to the proper sag between supports of the same level and to pull up the cable until the sag approximates the proper value.

Breaking Tension of Circular Loom Cable

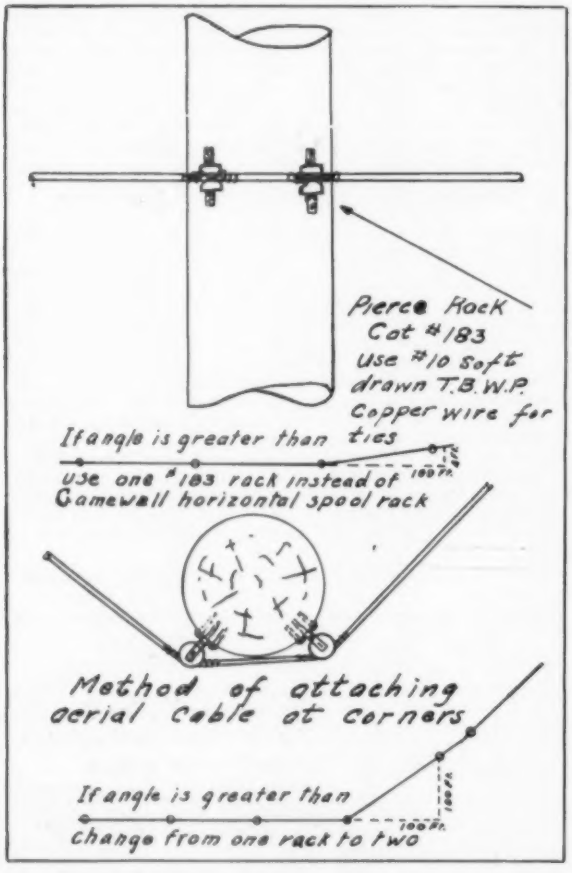
One manufacturer of circular loom cable went to considerable trouble several months ago to make actual tests of ultimate breaking loads for various samples of circular loom cable. One reason for our requesting these tests was that we had some doubt as to whether or not cables made of annealed copper conductors were sufficiently strong to withstand the loads applied to them after the strength of the loom covering had commenced to weaken. In other words, we felt, and had our opinions confirmed by the manufacturers, that it would not be advisable to erect this cable in situations where it was necessary to depend upon the strength of the loom covering for the support of the conductors. Such an installation would, of course, be permissible as a temporary expedient but for a term of several years the loom cover could not be expected to maintain the tensile strength that it possessed when new. On the other hand, the conductors themselves and the jute filling between conductors are so well protected that we felt it absolutely safe to depend upon their strength lasting for many years.

The data which we received from one reputable manufacturer


Gamewell Rack
Use ½" thru bolt at top except when office instructs you to substitute ½" x 3½" Fetter Drive Lag
When erecting rack, rotate same about bottom lag to draw head of lag lightly into groove of channel.
½" Thru Bolt
½" x 3½" Lag
5 Turns
5 Turns
Method of tying either cable or single wire. For cable always use #10 TBWP Soft drawn copper wire ties.
If angle in line is greater than 10°
use rack #183 as shown on Print C-12 instead of rack shown here

*Manager, Construction Department, the Gamewell Company. (From a paper read before the annual convention of the International Association of Municipal Electricians at Boston, Mass.)

gave 785 pounds as the breaking tension of circular loom cable made up of four No. 14 annealed copper conductors. For similar cable containing the same number of conductors made of hard drawn copper, we were quoted a figure of 1,145 pounds, and for a similar cable made up from four copper steel wires we were quoted 1,565 pounds as the breaking tension. Due to the fact that No. 14 conductors are used resulting in fairly high resistance the hard drawn copper conductors seem to be the best compromise, even though they lack the tensile strength of the copper steel. If one determines upon using 4/c No. 14, hard drawn copper conductors in making up the circular loom cable he can with reasonable safety depend upon the cable having an average breaking strength in the neighborhood of 1,145 pounds. Our problem, therefore, is to determine the proper sag of such cable for spans



of different length in order to be sure that the breaking strength of the cable will never be too closely approached.

Amount of Sag in Relation to Length of Span

By means of a little mathematics it can be shown that the tension in any cable suspended between two supports at the same elevations

$$= \frac{WL^2}{8S}$$

Where W = weight per foot of cable in pounds.
Where L = distance between supports in feet.
Where S = sag in feet.

A little thought will show that the above formula is the equivalent of stating that the tension in the cable increases as the square of the length of the span. In other words, if the length of span is doubled the tension, if the sag remains the same, is four times as great. If the length of span is tripled the tension in the cable, if the sag remains the same, becomes nine times as great. It is also apparent from a study of this formula that if the sag of the cable is increased sufficiently as the length of span increases the tension can be kept the same, even though very long spans become necessary.

Some time ago a question arose as to how much sag should be permitted in a certain instance and it became necessary to notify our construction men in the field what sags we expected provided in spans of definite lengths. We measured the approximate weight of loom cable made of 4/c No. 14 hard drawn, copper conductors and found it to be .16 pounds per foot. We observed the sag that had been allowed in certain instances where the cable had been in place for a considerable while and found that in a certain 99-foot span a sag of 20" below supports at the same elevation was used. Substituting these values in the preceding formula we got the following results:

Pounds tension in 99-foot span with a sag 20"=

$$\frac{.16 \times \overline{99}^2}{8 \times \frac{20}{12}} = 120 \text{ pounds tension}$$

I previously stated that data obtained from a manufacturer gave the tensile strength of this cable as 1,145 pounds. Therefore, in a 99 foot span having a 20" sag between supports the tension of the cable under normal conditions is approximately one tenth of the breaking load of the same. It is of interest further to know that the breaking load of 4 No. 14 hard drawn, copper wires is in the neighborhood of 700 pounds, and accordingly there is a margin of safety of approximately 6 in a span so erected if the strength of the jute filling be disregarded.

Element of Sleet and Wind Load Must be Considered

Unfortunately in many section of the country we have more than just the weight of the cable itself to contend with. At times very heavy sleet loads are experienced and on very rare occasion there is a heavy wind load combined with the weight of the sleet. These last occasions, however, are very rare. To get an idea, however, as to the load which the cable has to withstand during a sleet storm let us assume that a 4/c cable having a diameter of 6/10" has a coating of sleet ½" thick all around its circumference. A few calculations will show that such a coating of sleet will increase the weight per foot of cable by approximately .75 pounds which when added to the weight of the cable itself previously quoted as .16 pounds gives a total weight of cable of .91 pounds per foot. If we assume the 99 foot span and the 20" sag we can compute the tension in the cable when the same is subjected to a sleet covering of ½" all around its circumference throughout the entire 99 feet of span. The result is obtained as follows:

$$\text{Tension in pounds with sleet coating} = \frac{.91 \times \overline{99}^2}{8 \times \frac{20}{12}} = 670 \text{ lbs.}$$

This value you will note again is comfortably within the 700 pounds breaking strength of the copper conductors alone and is not greatly more than half of the ultimate breaking strength of 1,145 pounds quoted by the manufacturer. It does not seem to me necessary to carry these calculations further for the purpose of determining the effect of combined sleet and wind for the reason that they rarely occur in combination and because in our figures for the strength of the cable we have disregarded what, during a considerable portion of the life of the cable, increases its strength materially, namely the circular loom covering. As a matter of general interest it might be well for some of you to try to visualize an occasion when there has been a heavy wind and at the same time a heavy sleet load. I believe most of you will recall that the sleet broke away from a large portion of the cable and was left only at occasional points throughout the length of the span long before the wind sprang up.

Proper Sag for All Different Lengths of Span

The preceding discussion has dealt with a typical span of 99 feet between supports and a 20" sag. The discussion shows that such a sag does not result in dangerously high tension in the cable, even under sleet conditions. Furthermore it does result in a tension within the cable which is reasonably high and which, with reasonable factors of safety considered, may be regarded as a satisfactory working tension. It is therefore desirable to ascertain how the sag should be varied as the distance between supports is changed in order to maintain the same tensile loads in the cable. To arrive at a formula which will enable us to determine the proper sag for all different lengths of span we can proceed as follows:

Let L = A span of any length in feet.
Let D = The proper sag for the same span in inches.
Let W = Pounds weight per ft. of cable (equals .16 pounds in the case of 4/c circular loom).

Then from the above calculations which give 120 pounds tension

(*Continued on page* 26)

THE ROUND TABLE

For Practical Discussion of Current Fire Department and Fire Management Problems

DURING moments of great stress and excitement, it is not possible to recall routine movements suggested for most efficient work. The steps that are to be followed must be heeded almost mechanically as the result of frequent and thorough drills.

A typist, in the course of her work, never pauses to reason where a certain key is located. She strikes the proper key with almost mechanical precision and tempo, as the result of constant drilling and training. So, too, with the fire department.

The men must be trained to know their job thoroughly. Certain drills are more important in making better firemen than are others. Of course, this is a matter of personal opinion and experiences, and each chief officer has ideas that may not bear out the theories of others.

The problem that is treated in this issue is printed in the box on this page. In the box on the following page is the question that will be treated in the next issue. Should you have some comment that you would like to make on the next problem, or if you have a question that you would like to see treated in this department, write to the "Round Table Editor," FIRE ENGINEERING, 225 W 34th St., New York, N. Y.

HERE IS THE PROBLEM

What drills do you consider most essential for the men in the small city department?

Why?

The Question

Many chiefs believe that stress should be placed on a thorough knowledge of tools and appliances used by the fire department, and that the men must be drilled to respect discipline. The replies received follow:

John J. Towey, Chief, Newark, N. J.: I would recommend that an instructor be procured, who has graduated from a school of instruction in one of our large cities, to give a series of drills and talks on the use of fire department appliances; also the proper method of the use of smoke helmets and respirators.

The drills that are essential are as follows:

Connecting up suction from the engine to hydrant. This is done to see what judgment the chauffeur has in estimating the distance in taking a hydrant.

Stretching in line of hose and making the proper connection to engine and use of play-pipes.

When weather permits, use the water through hose with pressure. This method would be used to instruct new men regarding back pressure, and to teach them how to control a charged line of hose when working at a fire.

The proper use of hose straps—hose shut-off for burst length of hose, etc.

The proper use of siamese connections. The reasons why two lines are siamesed into one; why one line is used, and also why one line is changed into two lines.

How to take a charged lineup a ladder and also how to take a dry line up a ladder.

How to raise and lower a ladder and what distances different sized ladders should be placed from buildings.

The proper method of making different kinds of knots, such as rolling hitch, boling knot, etc.

The proper way to hold a lift net when in position for a person to jump into.

The proper use of all kinds of tools and implements used in extinguishing fires.

The proper use of gas masks and respirators.

The kinds of extinguishers to be used on different type fires.

These evolutions should be practiced in small city departments, as they are sometimes confronted with the same problems as the larger cities. For this reason they should be prepared to meet and cope with the various problems that arise.

Richard L. Smith, Chief, Pittsburgh, Pa.: The drills most called into play in the actual extinguishment of the greatest number of fires are the most essential to be familiar with. These include the following:

Quick laying in of chemical lines, efficient handling of chemical extinguishers, both foam and acid, backed up by equally quick and efficient laying of 2½-inch water lines and lead lines. This means the drilling of companies in the proper methods to employ in making the different layouts and also in the proper use of the small equipment to make same.

Men should also be drilled in the throwing and use of salvage covers.

The reason for the first drill is really answered in the first paragraph. These drills should be practiced to prepare them for quick action in the tasks with which they are confronted the most.

By the use of salvage covers and general salvage activities we can cut the total fire loss considerably, in some cases as much as 75%. This is a sufficient reason for instructing men in the performance of salvage operations.

E. F. Ackley, Chief, Gainesville, Texas: The question you have asked is one of the greatest problems with which fire chiefs are confronted.

In most small towns the buildings are seldom more than two stories high. This, to some extent, simplifies the drill question, as there is no use in performing drills that will never be put to use. By this I mean such operations as using Pompier ladders and life nets. Also as there are usually no high pressure systems available in smaller cities, it is not necessary for men to be drilled in the use of high pressure streams.

However, it is essential that men be familiar with all the equipment in use in their departments. They should be instructed in the proper use of such equipment in order to be able to work with speed and accuracy. It is essential to be acquainted with the various problems that are likely to be encountered in the performance of their duties. It is not enough for firemen to simply be "water squirters."

If more than one type of extinguisher is used, the man should be familiar with the operation of each particular type.

Above all, members of departments should be informed of the dangers liable to be encountered at fires and also how to avoid such conditions. As chief of a volunteer department I do not want my men sent into places where there is a chance of their being injured or perhaps crippled for life.

Eugene T. Ricker, Chief, Biddeford, Me.: One man, preferably an officer who has successfully completed the course in a large city fire department drill school, should have full charge of all drills. The most essential evolutions for members of the department are: The proper use of all tools and fire fighting appliances; systematic training in ladder work; making hose connections to pumping engines, deluge sets and turret nozzles; the proper method to ventilate different types of buildings. Different types of fire extinguishers should be demonstrated and the men taught the effect of same on different fires. They should also know how to recharge extinguishers. Pump operators should be instructed in the fundamental principles of fire department hydraulics.

No more than twelve men should constitute a class in order that each individual has ample opportunity to receive and digest all of the instructions. The chief of the departments should have a heart to heart talk with the men and impress upon their minds the drastic measures that will be taken if any of them are found guilty of unnecessary destruction of property by water or the untimely use of any tool.

The reason firemen should be drilled is that they are servants of the public, paid by them for the protection of life and property. In order to fulfill our responsibilities we must maintain discipline and have teamwork. For this reason it is essential that firemen in small city departments have systematic training.

Peter J. Rosar, Chief, Scranton, Pa.: I consider discipline the prime factor in any fire department. Without discipline you haven't any organization. Every member should be schooled to talk and promote fire prevention.

From my experience I have found that ladder work is one of the most essential duties to be performed at a fire. A good many departments are lacking in this respect.

Men should also be instructed in fire department hydraulics. From my observations I have found many instances where engineers have not been properly instructed in the handling of pumps.

The above, to my mind, are the most important drills and should be practiced in every department.

Donald J. Rayburn, Chief, Eldorado, Kans.: The drills which I consider most beneficial to efficient operation of this fire department are: First, the "spotting" and connecting of pumping engines to hydrant with hard suction. (Lack of men compels us to operate both of our pumping engines with only one man to each truck.) Second, the handling of ladders, especially the 35 and 50-foot sizes. Third, handling fire lines, the proper size nozzles to use, and a thorough knowledge of the numerous small appliances and equipment in the department. And last, a very thorough understanding of first aid and rescue methods. This is of inestimable value during times of accident or catastrophe.

J. H. Harrison, Chief, Brunswick, Pa.: The drills which I consider most essential for small departments, such as our own, are as follows:

Drilling men in the use and care of apparatus. In small departments each man must be depended upon more or less to handle the apparatus and care for same. For this reason such knowledge is necessary.

Members of the department should have a knowledge of the location of fire hydrants and fire alarm boxes. They should also be familiar with the streets in the mercantile and residential districts. It is very important that the men know the location of the nearest hydrant when a fire occurs, as this saves time. Valuable time is also saved when the members are acquainted with the location of the various fire alarm boxes and know the route to take in order to reach the scene at the earliest possible moment.

Instruction should be given in the methods of fighting various type fires. The problems likely to be encountered at a fire in the mercantile district and also in the residential section should also be taught to the men.

HERE IS THE PROBLEM FOR THE NEXT ISSUE

To what extent is inspection work carried on by members of your department?

Are all buildings in the city inspected, and if so, how often are dwellings inspected?

How often are business buildings inspected — how often factories?

Do officers do any inspection work, and if so, what?

Jack M. Byers, Chief, Hagerstown, Md.: Members of fire departments should be drilled in making hose connections in order that this may be done as quickly as possible. Instruction in the proper method of raising and lowering ladders of different lengths and also carrying lengths of hose up ladders is also essential. Other important evolutions are the laying of hose lines up stairways, ventilation, first aid work including resuscitation, and a general knowledge of how to use all the equipment employed by the department in fighting fires.

When you mention "small city department" I presume you mean a town the size of Hagerstown (35,000) and also smaller cities where volunteer departments are generally found. With few exceptions, you will find no drill towers, etc., for the complete training of men in small cities. For this reason I suggest the drills mentioned above.

James Craney, Chief, Missoula, Mont.: I consider drills in the proper manning of all pieces of apparatus the most important in a small city. In view of the fact that the average small city is considerably lacking in sufficient personnel, I believe each man should understand thoroughly how to handle and operate every piece of apparatus.

Harry Parker, Chief, Newark, N. Y.: We consider that a thorough knowledge of laying fire hose is most essential. The reason for this is that good pressure is dependent upon proper hose layouts. Drills in handling ladders might be mentioned next. It is also very necessary that members of the department are properly instructed as to how to carry hose up ladders.

W. R. Schenck, Chief, Somerville, N. J.: I instruct the foreman to have as many drills as possible in order to acquaint the men with the apparatus and equipment used in the department.

C. A. Wolverton, Chief, Port Angeles, Wash.: Members of fire departments should be instructed in the proper use of all the appliances used in fighting fires. In order for the department to operate efficiently, the members must know how to lay hose properly. They should also know what size nozzles are to be used and understand how to operate fire streams in order to obtain the best results.

H. L. Taylor, Chief, Rome, Ga.: Where departments have no drill towers, all the members should be instructed in the handling of hose lines. They should also be taught how to use ladders. That is, the distance they are to be placed from buildings, and how to raise and lower them. As a matter of fact, it is necessary that the men be instructed in the use of all equipment employed by the department in extinguishing fires.

In small departments the men do not have the opportunity to use all the equipment. For this reason it is very necessary that regular drills be maintained so that when it is necessary for them to use a certain piece of equipment, they will know how to use it properly.

Arthur Newton, Chief, East Chicago, Ind.: The drills which I consider most important are: Laying hose, handling ladders and artificial respiration.

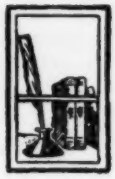
These drills are especially essential in small departments. In order to check the spread of fire, it is necessary that men know how to lay hose lines and raise ladders as quickly as possible. A knowledge of artificial respiration is, of course, invaluable in the saving of life.

Wm. S. McLoughlin, Chief, Bayonne, N. J.: Having had the privilege of attending and participating in the drills of the New York City Fire Department school of instruction, it is my opnion that about seventy-five per cent. of the evolutions used in that school could be practiced to advantage in both large and small city fire departments.

J. P. Horne, Chief, Fitzgerald, Ga.: I consider ladder drills the most essential for small fire departments. These departments are more or less confronted with roof fires and for this reason it is necessary for the men to have a knowledge of how to use ladders properly. Men properly trained in the use of ladders know how to place them in order to reach the seat of the fire quickly. This

(*Continued on page 27*)

WITH THE EDITOR



Decision May Do Away With Grave Fire Menace

The Corporation Counsel, by an important recent decision, has apparently opened the way to the removal of what has long been a thorn in the side of the Fire Department of New York City. Along the ocean shores of the greater city—Coney Island, Brighton and Manhattan Beaches and the Rockaways—there have sprung up small frame structures, little more than shacks of the most inflammable type, built for the purpose of summer bungalows, rooming houses and hotels.

Heretofore, these structures have been under the jurisdiction of the city's Tenement House Department, but, according to the decision referred to, this department no longer has control over them, and the supervision is transferred to the Building Department. The decision was the result of a conflict of authority between the two departments, and a request for a ruling in the matter by the Tenement House Commissioner.

The important part of this decision is that the rules of the Building Department are of a much stricter character than those of the Tenement House Department, and it is probable that, by their enforcement, many of the worst and most dangerous of these structures from a fire standpoint, will be permanently done away with. Many of them have been erected with the object of using them only during the summer months, and they are mostly of from one to three stories in height, of the flimsiest frame construction possible.

There are probably well over two thousand of such fire menaces along the shore fronts that will be affected by this decision. If it results in their demolition and replacement by well built, fire resistive structures, the ruling by the Corporation Counsel will prove to be a real public benefit.

One Way of Settling a Strike

The Latin American nationals have a method of dealing with matters governmental and otherwise, that, while it may not always meet with Anglo-Saxon approval, must arouse our interest by its directness of approach. Thus, for instance, in cases of revolution or insurrection, the firing squad is considered the remedy par excellence.

An example of this direct method occurred recently in the republic of Uruguay, which, while it did not go so far as to involve the use of the firing squad, at least was equally effective in producing results.

The members of the Montevideo Fire Department had demanded a raise in their salaries, and, when the Uruguayan Congress adjourned without granting the increase, the men went on strike. Some members of the Police Department of the city followed the fire fighters' example and voted to take part in the demonstration for a higher living wage.

However, the authorities were by no means dismayed by the situation. By a shrewd counter-stroke, they at once summoned all of the malcontents to the colors as regular soldiers. When some of the strikers balked at the order, they were promptly arrested as deserters, the headquarters were occupied by details from the army, and further defections from the firemen's ranks was effectually prevented.

While, no doubt, the firemen of Uruguay had very good cause to object to the rates of salaries paid them, if these were as low as some of those paid firemen in the United States, they certainly were not justified in striking, any more than the men of fire departments in this country would have any excuse for walking out and leaving the municipality undefended in case of a serious fire. There are other effective means of obtaining justice, as the firemen of the United States well know. Public opinion can easily be educated in favor of a justified raise in the firemen's pay by proper publicity, and few politicians can or will withstand public opinion very long. A strike, on the other hand, is apt to alienate the people from the firemen's cause, as such an action is a direct thrust at the safety of the citizens.

A Complicated Fire Tax Situation

In one of the Southern States, a situation has arisen among the volunteer fire departments that is, to say the least, rather complicated. A graduated tax is levied for the support of the departments and for the expenses of equipment, ranging from two to five cents on the $100 property valuation. In the state referred to a law requires that all property purchased by this tax money shall become the property of the county. The fund raised by the tax is under the direction of the Board of Supervisors of the county.

Most of the volunteer companies of the particular section of the state in which the question of expenditures has arisen, have recently raised considerable money, through entertainments, donations, etc., and have spent it in the purchase of apparatus for the various companies. They are naturally unwilling to have any of this tax money expended upon these

apparatus, as regards the replacement of parts, repairs, and so on, as the claim is that there would be danger that ownership of the apparatus with replaced parts would be claimed by the county.

The various companies have spent in the neighborhood of $60,000 for new apparatus, and they naturally do not care to run the risk of losing title to it through the purchase of replacements. In order to get around the law, it has been decided to purchase replacements and additions to hose and supplementary supplies, and rely principally upon donations and entertainments for parts of apparatus needed. By this means, while curtailing slightly the amount received for supplies, the companies will thus retain title to their apparatus, and complications will be avoided.

CHANGES IN BOSTON'S FIRE FORCE SUGGESTED BY COMMITTEE

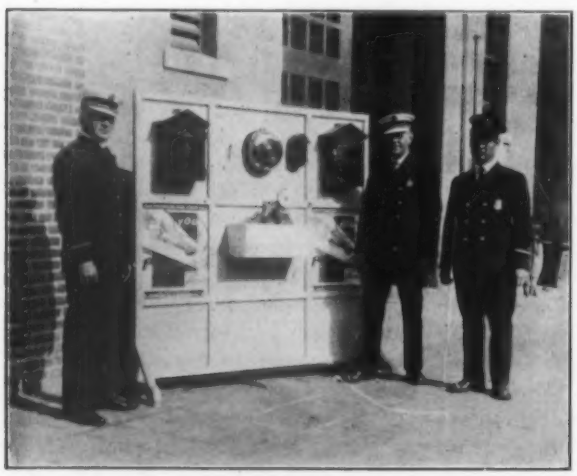
Many Important Recommendations for Reducing City's High Fire Losses Offered—Present Fire Force Praised

SWEEPING recommendations for the reduction of Boston's extremely high fire losses are made in a detailed report on "The Problem of Fire Waste and Insurance Rates in the City of Boston," presented to Mayor Malcolm E. Nichols today by the Mayor's Committee on Fire Insurance Rates.

The recommendations are based on a survey conducted for the Committee by Miller McClintock, Director of the Albert Russel Erskine Bureau in Harvard University. The survey analyzes in great detail every aspect of the city's fire problem, and is the result of seven months of intensive study by a field engineering staff under the direction of Horatio Bond, field engineer of the National Fire Protection Association, and chief engineer of the survey. The results are presented in a 300 page report including over 150 tables and charts which emphasize the microscopic character of the survey.

Personnel of Mayor's Committee

The Mayor's Committee on Fire Insurance Rates was appointed some time ago to investigate the factors responsible for what Mayor Nichols declared to be unreasonably high insurance rates. Members of the Committee are Felix Vorenberg, chairman, Francis R. Bangs, S. Bruce Black, Frank L. Brier, Guy W. Cox, Frank S. Deland, Charles L. Edgar, Freeman O. Emerson, William Gilmour, John B. Graham, Eugene C. Hultman, P. Harry Jennings, John J. Kearney, Edward T. Kelly, Arthur N. Maddison, David T. Montague, Thomas W. Murray, Maurice M. Osborne, James J. Phelan, Hon. Andrew W. Peters, Louis K. Rourke, Elwyn G. Preston and William A. Fisher.



Making the Public Fire Alarm Conscious

A portable display was erected in Santa Monica, Cal., to educate the public in the proper operation of the fire alarm system. From left to right, the men are Chief W. J. Mohr, Assistant Chief Edward Marshall, and Homer Caswell, superintendent of fire alarm.

Premiums Not Excessive as Compared with Other Cities

In general the report finds that Boston's insurance premiums are not excessive as compared with other cities with equal fire losses. Boston's premiums total approximately $9,000,000 a year, which imposes a burden of approximately $50 a year on the average Boston family. Yet the survey points out that Boston has had a higher per capita fire loss than any other large city in the country.

Comparison with other large cities shows Buffalo next in per capita fire losses for the five year period taken by the survey. St. Louis ranks third, and New York fourth. Following New York are Pittsburgh, Detroit, Philadelphia, Baltimore, Cleveland and Los Angeles.

Boston has nearly twice the annual fire loss of Baltimore, a city of about the same population, and about the same annual losses as Philadelphia and Detroit, cities more than twice her size.

"It is quite possible to reduce the fire losses in Boston by one-half," the report states. "If losses were so reduced and the reduction sustained, a reduction in rates would reasonably follow."

Great Improvement Under Present Fire Department Administration

The report discloses a marked reduction in insured fire losses during the past two years under the improved present administration of the city fire department, losses having been cut from the $5,000,000 a year average for the period 1923-27 to $3,700,000 in 1927 and $3,500,000 in 1928.

"Insurance rates are not alone based on the loss experience of a single city but secondarily on that of the state and nation. Boston's high loss ratio has been exceeded generally throughout the state. It is for this reason that projects for cooperation in fire waste reduction in Boston's surrounding territory and the state are included in the report."

Factors Responsible for High Fire Loss

Factors primarily responsible for the high fire loss, according to the report, include faulty building construction, limitations of personnel of the fire department, ineffectiveness of the State Department of Public Safety, and the negligence of individual property owners.

"Boston has already paid and may yet pay more dearly for the character of her buildings housing valuable stocks in the business portions of the city. Brick walled buildings with wooden interiors are essentially furnaces with the doors and windows potential draft openings. The report shows that most Boston dwellings have similar defects and indicates that the serious fires which have been occurring in apartment houses have been due to the spread of flames through unstopped interior walls and up unprotected stairways and unenclosed vertical shafts."

Present Building Code Criticised

The report makes a strong indictment of the Boston building code, stating that in its present form the code tends not only to discourage improved types of construction but to stimulate the erection of the types of buildings now responsible for the city's bad fire record.

"There is practically no incentive under the code to erect good buildings," the report states, commenting further that its lack of codification since it was first drafted in 1907 has been partly responsible for its having so long escaped the attention of public spirited men interested in keeping Boston in step with the improved building construction of the age. "No time should be lost in revising, rewriting, and bringing up to date this fundamental vehicle of the city's physical progress."

It was specifically recommended that the code be revised with special attention to the following major items: "Arrangement of the code in logical sequence for the con-

(*Continued on page* 24)

Questions and Answers

NOTE—Readers are invited to send in questions, which will be answered in the order received. Names are omitted from questions unless otherwise specified

Fumes from Carbon Tetrachloride

To the Editor:

Several nights ago we had a fire in a very small and poorly ventilated room. Someone, just prior to our arrival, emptied a carbon tetrachloride extinguisher in an effort to put out the blaze. One of our men was overcome by the gas in less than two minutes and two others were very nearly overcome.

I am writing to you hoping to learn just what the chemical action is that takes place when an extinguisher of this type is used and what the effect on men might be. Also, can you tell me what the best methods of resuscitation are?

If these extinguishers are as dangerous as they seem to be, I should think some warning should be given to the people using them. For example, a word or two might be put on the label telling that caution should be used when fighting a fire where there is not a good circulation of air.

Very truly yours,
A. N. H.

Answer: When carbon tetrachloride extinguishers were first introduced it was observed that under certain conditions the decomposition of the liquid by heat gave rise to toxic and poisonous fumes, which were presumed as possibly inimical to human life. As a matter of fact, there is no more danger in the use of carbon tetrachloride on fires than any other liquid, provided there is ample ventilation. The combustion of any ordinary material generates gases of a toxic and poisonous effect, e. g., carbon monoxide, acrolein, pyroligneous acid (wood), sulphur compounds, etc. These gases are given off in more or less great volumes, with flocculated carbon (smoke), and because of this fact, firemen, when working on fires in confined spaces, use smoke masks or smoke helmets, etc. Before the use of breathing apparatus in such fires, fatalities among firemen by asphyxiation, or gas poisoning, were frequent, and partial asphyxiation and mild poisoning were of everyday occurrence, and disabled victims for days at a time.

The concentrated extinguishing power of carbon tetrachloride caused it to be very quickly adopted in all industries, with the result that many thousands of fires have been nipped in their incipiency which otherwise would have developed into serious outbreaks. It is a coincidence, however, that the efficiency of carbon tetrachloride gave rise to many objections to its use. That is, that it developed, under disintegration by heat, toxic and poisonous fumes. Fires involving highly inflammable combustibles which previously had to be fought at a distance, due to their great heat and fumes, are now attacked by first-aid carbon tetrachloride extinguishers at close range, with the natural result that operators are liable to get a whiff of acric carbon tetrachloride gas, which is more unpleasant than carbon monoxide-drenched smoke, but less dangerous under ordinary conditions.

Indeed, there is any advantage often with carbon tetrachloride insofar that the spread of fumes is more sluggish than ordinary smoke heavily charged with toxic poisonous gases of combusting materials. However, there are certain classes of fires in which the smoke from the burning materials may not be present in large quantities, but the use of carbon tetrachloride immediately generates a heavy volume of carbon tetrachloride gases. The effect of the fumes on inhaling, however, is only temporary unless, as in the case you mention, the fire occurred in a very small space with deficient or no ventilation.

Analysis of gases given off by the decomposition of carbon tetrachloride have been made by the British National Physical Laboratory, the U. S. Bureau of Mines and the Underwriters' Laboratories of Chicago. The results of the tests have been similar in all cases, varying only in detail, according to the chemical mixed with the pure carbon tetrachloride in order to reduce its freezing point; the point of pure carbon tetrachloride is about 9° F. The chemicals added to the pure carbon tetrachloride in addition to the carbon-disulphide may be either chloroform, turpentine or flammable petroleum oil.

The gases and proportions thereof given off by decomposing standard carbon tetrachloride fire extinguishing liquids on wood fires are as follows: Dry gas, per cent by volume, oxygen 15.5; carbon dioxide, 4.6; chlorine, nil; carbon monoxide, nil; sulphur dioxide(present only when carbon disulphide in liquid); hydrochloric acid, 0.16; phosgene qualitative test, present; phosgene, parts per million, 3. Where 10 per cent. chloroform was present in the carbon tetrachloride the phosgene amounted to 149 parts per million.

On alcohol fires the proportion of oxygen was 17.4, carbon dioxide 5.6, carbon dioxide and chlorine nil; hydrochloric acid, 0.1; phosgene 95 parts per million.

On petrol fires the gases present were: Oxygen 19.4 per cent.; carbon dioxide, 1.5 per cent.; carbon monoxide and chlorine, nil; hydrochloric acid, 2.08 per cent.; phosgene, 2 parts per million. With carbon disulphide present in carbon tetrachloride the phosgene quantity was 160 to 1,000,000.

The tests conducted by the U. S. Bureau of Mines gave chlorine gas as present in the proportion of 10 to 23 parts per million. This gas is present only when the carbon tetrachloride liquid is applied to hot iron.

Carbon tetrachloride is a light colorless fluid, with a peculiar odor. It is non-flammable and evaporates quickly when exposed to the air.

Phosgene ($C.O.C.l_2$) is a colorless gas, extremely poisonous, and was largely used in the Great War as a poison gas.

Chlorine gas (Cl_2) is a heavy, greenish-yellow gas and very poisonous.

Hydrogen chloride gas (hydrochloric acid gas, muriatic acid gas), H.Cl., is a colorless, poisonous gas.

Carbon tetrachloride gas is only slightly poisonous compared to phosgene and chlorine; its effects being similar to chloroform.

In open spaces with good ventilation these gases will not be formed in quantities sufficient to give a concentration of poisonous fumes dangerous to the operator of the extinguisher.

The tests in which the proportions of gases given above were found present were made in enclosed spaces. In order to be able to take samples of the atmosphere therein during the tests, the U. S. Bureau of Mines used a gas-tight room, 1,000 cubic feet capacity.

Carbon tetrachloride gas, it was found, might be present in quantities of from 2,000 to 5,850 parts per million. This amount is less than the maximum of 4,000 to 6,200 parts per million which can be inhaled for an hour without serious disturbances. It is less than one-tenth of the concentration required for the lethal or fatal dose for a half-hour exposure. We have ourselves worked, without noticeable toxic effects, for half an hour and more in an atmosphere loaded with carbon tetrachloride gas.

Hydrochloric acid gas may be present at the percentages given, in quantities of from 60 to 236 parts per million. This amount cannot be inhaled for one hour without serious disturbances, but it is much less than the concentration of from 1,000 to 2,000 parts per million, which is dangerous after a half-hour exposure.

Chlorine gas, we have pointed out, is only present when the carbon tetrachloride fluid is applied to hot iron, and may have a concentration of 10 to 23 parts per million. But in small closed places such as a vault, small closet, or cellar room, particularly where there are no means of prompt exit, there is danger, whatever type of extinguisher is used in such places, the smoke from the burning materials would necessitate the use of a gas mask or other breathing apparatus.

The danger of poisonous fumes where acids of chemical supplies are to be extinguished should be recognized and safeguarded, according to the conditions, whatever the type of extinguisher employed, soda and acid, froth, or carbon tetrachloride.

Thousands of tests in extinguishing fires by carbon tetrachloride liquid have been made during the past twelve years by the Underwriters' Laboratories, and no apparent injury to the health of the operators has been experienced, although the irritating fumes caused lachrymation, and in some cases resulted in a subnormal feeling for several days. The tests were made under varying conditions and included the use of small rooms partly ventilated, with repeated exposure, in some cases for hours at a time.

Insofar as methods of resuscitation are concerned, these are the same as are applied for ordinary asphyxiation by illuminating gas, etc.

Making Decorations Fire Resistant

To the Editor:

One of the Civic Organizations in our town desired to hold a barn dance in our State Armory. They wish to use decorations, corn stalks and straw, but due to the regulation regarding all fireproof or fire resistant material that must be used in the decorations of the State Armories, they have been advised that they cannot use corn stalks or straw unless same can be fireproofed or made fire resistant. Do you know of any method or formula that can be used to treat such material so that it could be used for decorative work? If so, we would appreciate very much your sending same to us.

Very truly yours,
R. L. D.

Answer: The following solutions are useful for rendering goods of an absorbent nature fire resisting:

For light stuffs: Sulphate of ammonia 8 lbs., carbonate of ammonia 2½ lbs., boracic acid 3 lbs., borax 2 lbs., starch 2 lbs., dextrine or gelatine ½ lb., water 100 lbs.; use at 86° F. (30° C.).

For scenery and light woodwork: Ammonium chloride 15 lbs., boracic acid 5 lbs., fish glue 50 lbs., gelatine 1½ lbs., water 100 lbs., and chalk sufficient to give a suitable consistency: apply two or three coats with a brush, at from 122° F. (50° C.) to 140° F. (60° C.).

For cordage, etc.: Ammonium chloride 15 lbs., boracic acid 6 lbs., borax 3 lbs., water 100 lbs., steep for 15 to 20 minutes at 212° F. (100° C.).

For paper (printed or not): Sulphate of ammonia 8 lbs., boracic acid 3 lbs., borax 2 lbs., water 100 lbs.

A solution composed of—
Phosphate of ammonia, 1 lb.,
Chloride of ammonia, 2 lbs.,
Water, 1½ gals.,
has been found to render many fabrics efficiently fire-resisting.

It is always advisable to try any solution on a sample of the textile to be treated before dealing with a large quantity. If the result of the test is satisfactory and has not injured the material or affected its color, the bulk can then be treated.

As most of the antipyrenes are hygroscopic, great care is required in treating valuable articles.

Film Laboratory Wrecked by Series of Explosions

The entire plant of the Consolidated Film Laboratories, Hollywood, Cal., operated by the Eastman Kodak Company, was destroyed by a series of explosions and by a fire that swept through the plant. It is believed that a cigarette ignited the film. This company develops and prints about seventy-five per cent of the film in Hollywood. It is believed that over $6,000,000 worth of motion picture film was destroyed. The photograph shows the front view of the film plant, shortly after the explosion.

FIRE ALARMS INCREASE IN NEW YORK CITY IN 1929

Stations Opened in Various Sections —New Apparatus Purchased — Insurance Rates Reduced—Force Added To

FIRES increased in number in New York City during the year 1929. Last year there were 29,724 fires, an increase of 3,539 over the year 1928. This is an increase of 7,095 over the record five years ago and an increase of 16,295 over the record of ten years ago.

Twelve new fire engine houses were opened during 1929 at the following locations: Rosedale, Arverne, Hillcrest, St. Albans, East Elmhurst and Douglaston in the borough of Queens; Foster and Gravesend avenues, in the Rugby section; Middagh Street in the downtown section and Neptune Avenue in the Coney Island section of the borough of Brooklyn; Eastern Boulevard in the Clason Point section and Williamsbridge Road in the Westchester section of the Bronx; and East 13th Street near Fourth Avenue in the borough of Manhattan.

New Fire Apparatus and Equipment

Approximately a half million dollars in new fire fighting apparatus was spent during the year for 48 hose wagons, 29 motor cars for chief officers, one tractor, one water tower, four aerial hook and ladder trucks, 7 pumping engines and 3 four-wheel tractors.

A reduction of one per cent. in fire insurance rates was allowed by the New York Fire Insurance Exchange in recognition of progress made in the fire alarm telegraph plant in sections of Brooklyn and Bronx where underground cables replaced aerial circuits on poles. Nearly $750,000 in contracts for fire alarm telegraph improvements was awarded during the year. Nearly 1,000 new fire alarm boxes were installed, 42,000 feet of underground pipe installed, and 325,000 feet of underground cable installed.

During the year 393 firemen were appointed on probation of which number 40 were patrolmen in the Police Department at the time of appointment. Service in the Police Department, under a recent law, is credited to the Fire Department record of seniority of a member who accepts appointment in the Fire Department. It is reciprocal if a fireman accepts appointment in the Police Department, but the latter instances are negligible.

One hundred and seven fire fighters retired voluntarily during the year, of which number 53 were blueshirts and the balance officers. Due to the pending salary increases for members of the Fire and Police Departments who were not included in the salary referendum voted for so affirmatively at the polls last election, there have been no voluntary retirements of fire officers since last September.

Deaths and Resignations

Thirty-two members of the department died during 1929, seven of whom made the supreme sacrifice in the line of duty. Only six firemen were dismissed from the service after a hearing on charges for violating the rules of the department. Seventeen firemen resigned during the year, nine of whom did not complete their probationary term.

The others had donned the uniform before they had a change of heart about smoke-eating.

WM. JEROME DALY.

Ackerman Celebrates Anniversary—John L. Ackerman of Latrobe, Pa., has just completed eighteen years service as head of the Fire Department.

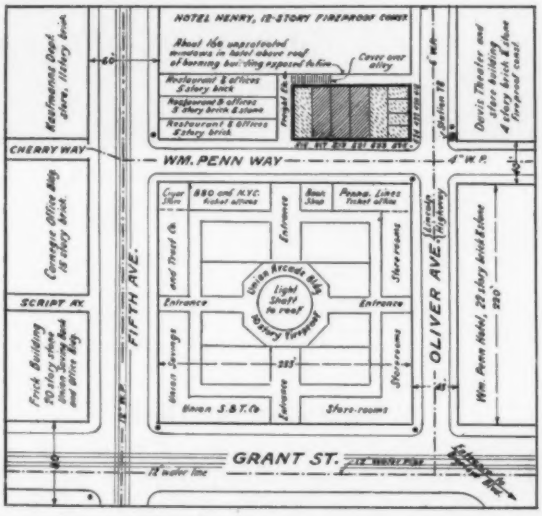
Steubenville Asks for Telephone Cooperation—Chief Edward J. Green of Steubenville, Ohio, has appealed to the public for cooperation in submitting alarms by telephone. Many of the calls received do not give explicit directions as to the location of the fire and what type blaze it is. The installation of new fire alarm boxes is progressing rapidly.

CELLAR BLAZE DEVELOPS INTO THREE-ALARM FIRE

Narrow Alley Separated Burning Building from Hotel—Firemen Troubled by Dense Clouds of Smoke—Fire Did Not Spread

By WILLIAM E. PATTERSON

ONE of the most stubborn cellar fires that has taken place in Pittsburgh for years, broke out from an unknown cause in the basement of the old Pittsburgh Leader building in the congested downtown business district Saturday, November 23rd, just before noon. Dense clouds of smoke drove the tenants and customers of a number of small


HOTEL HENRY, 12-STORY FIREPROOF CONST.
Cover over alley
CHERRY WAY
WM. PENN WAY
SCRIPT AV.
FIFTH AVE.
OLIVER AVE
GRANT ST.
Union Arcade Bldg.
Light Shaft to roof
Entrance
Entrance
Store rooms
Store rooms
Store rooms
Union S.B.T. Co.
Wm. Penn Hotel, 22 story brick & stone
Davis Theater and store building, 4 story brick & stone, fireproof const.
Kaufmanns Dept. store, 11 story brick
Carnegie Office Bldg. 15 story brick
Frick Building 20 story stone Union Savings Bank and Office Bldg.
Union Savings and Trust Co.
Penna. Lines Ticket Office
B&O and N.Y.C. ticket offices
Cigar Store
Restaurant & offices 5 story brick
Restaurant & offices 5 story brick & stone
Restaurant & offices 5 story brick
Proposed Bridge
Subway
Subway
Above the unprotected windows in hotel above roof of burning building exposed to fire
GRANT ST.

Arrangement of Buildings and Hazards at Pittsburgh Leader Building Fire

shops and stores occupying the first floor to the street. The upper floors of the building were unoccupied.

Because of the many important business structures in the neighborhood, office buildings, hotels and department stores, and the fire gaining headway and threatening to reach dangerous proportions, three alarms were sent in calling twelve engine companies, three truck companies, one squad company, one water tower company, chief of department, one deputy chief and two battalion chiefs to the scene of the fire.

The first alarm, turned in at 11:33 a. m., was answered by Engine Companies No. 1, 3, 30 and 33, Truck Companies No. 1 and 3, Squad Company No. 1 and Water Tower Company No. 1 in command of Battalion Chief George P. Sparr of the First Battalion and Deputy Chief Frank G. Jones.

Upon the arrival of the First Alarm Companies, the fire had already gained considerable headway. Heavy clouds of smoke and sheets of flame reached across the sidewalk from the store rooms occupied as a valet and tailor shop on the William Penn Way.

Owing to the dense clouds of smoke, firemen were unable for sometime to locate the seat of the fire, being driven out of the basement by the smoke, where a number of them under the leadership of Deputy Chief Jones had made their way. The men of the first alarm companies worked hard in dense clouds of smoke to kill the fire raging in the rooms of the tailor shop on the first floor.

Seeing that the fire was rapidly spreading through the basement and up to the store rooms on the first floor, the second alarm was sent in at 11:55 a. m., calling Engine Companies No. 2, 4, 19 and 32 and Truck Company No. 46, which was followed shortly by the third alarm, calling Engine Companies No. 5, 7, 11 and 18 in command of Battalion Chief William H. Kuhlman of the Fifth Battalion.

Great clouds of smoke continued to roll in from the burning structure. For a time, fire department officials feared that the fire was going to spread through the whole building and out through the roof and extend to the upper floors of the old Hotel Henry, a twelve-story brick and stone building running through the block from Fifth to Oliver Avenue. It was separated from the burning building in the rear by a narrow eight foot passage way, the side of the hotel having many open and unprotected windows on all floors.

Chief of Department, Richard L. Smith, quickly observing the danger of the fire spreading to the hotel through the unprotected windows, had his driver and aide go through the hotel and have the house lines connected with the stand pipe on the different floors of the hotel ready for immediate use.

Fortunately, after a hard fight, the firemen under the command of Chief Smith, Deputy Chief Jones and Battalion Chiefs Sparr and Kuhlman, got the fire under control and confined the fire to the basement and a few of the store rooms on the first floor, which were completely burned out.

Eighteen pumper streams equipped with shut-off nozzles and 1⅛ and 1¼ tips, supplied by seven 1,000-gallon and four 750-gallon American-LaFrance and one 1,000-gallon Ahrens Fox combination gasoline pumpers from hydrants carrying from ninety to one hundred pounds pressure were used to extinguish the fire; 6,200 feet of 2½-inch hose and 200 feet of one-inch lead line hose, all cotton rubber lined and 397 feet of ladders were in service.

In addition to the eighteen streams in service at the fire, Chief Smith had a large deluge hose, turret and water tower wagon of Engine Company No. 1, connected up in front of the burning building on William Penn Way, ready for service with its large high pressure fire streams if the fire should gain any further headway and spread to the upper floors and to the roof of the burning structure.

Eight firemen were slightly injured, or overcome by the dense clouds of smoke. They were given first aid on the fire ground by Chief Police and Fire Surgeon, Daniel E. Sable. Some were sent to the Mercy Hospital for further treatment.

As the fire took place just about noon when the downtown streets were jammed with Christmas shoppers and the many office workers from the large office buildings

Firemen Operating in Alley Separating Building From Hotel

The fire-fighters are on the covering over the passageway. The Hotel Henry is at the right.

surrounding the burning structure, police reserves and detectives were called out to keep the immense crowds out of the danger zone.

During the early progress of the fire, when the firemen finally succeeded in fighting their way into the cellar with gas masks, directly under Higgins Valet Shop, they came across four five-gallon cans containing gasoline, one filled to the top and the other three about three-quarters filled. The firemen hurriedly carried the cans to the street before the fire reached the containers and exploded them.

The burned building was a three-story brick and stone

structure fronting 120 feet on William Penn Way and extending back along Oliver Avenue a distance of 50 feet to an eight foot alley, used by the employes of the Hotel Henry and occupants of the burned structure. The building was constructed by the Pittsburgh Leader to carry the heavy printing presses, linotype machines and other equipment of the modern newspaper plant.

The first floor of the building was divided into five store rooms on William Penn Way and four on Oliver Avenue, while the cellars beneath the store rooms on William Penn Way were divided into two separate sections by an aisle-way from which a door opened into each section. The partitions which divided the cellar into sections, were constructed of wooden lath, plaster and wooden frames and doors.

There was only one stairway reaching the basement from outside the building. It was located in the rear and opening from the narrow alley into the burning building.

The building was insured to the amount of $140,000.

Fireman Killed in Boston Fire

One Boston fireman was killed and several were injured while fighting a 3-alarm fire that caused damage of $150,000 in the 4-story stone mercantile building at 76 High Street in the down town district of Boston, Mass., on the night of December 2d.

The flames had obtained great headway and were shooting from the first floor into the street when the apparatus arrived in response to the first alarm from Box 1422 at the corner of High and High Street Place.

Deputy Chief John Kelly ordered a second alarm at 10:50 p. m., five minutes after the first alarm. Chief Daniel F. Sennott sounded the third alarm at 11:14. By this time the flames had gone through the roof and the sky was illumined with a lurid glare while a myriad of sparks drifted upwards.

Brick fire walls prevented a spread of the fire to adjoining sections of the block. Lines were taken over stairways and ladders in front on High Street and over a fire escape in the rear. Both high and low pressure hydrants were used.

A wagon stream and water tower were used in front of the building for a short time. William Emmel, a member of Ladder Company No. 8, was found lying unconscious in a pool of water on the top floor where he had been overcome by smoke and fumes. He was rushed to the Relief Hospital but was dead upon arrival.

The building was occupied by a toy concern and silver plating establishment. There was also a paint shop in the

Rear View of the Burning Mercantile Building

structure. The cause of the fire is unknown, but it had evidently been smouldering for hours before it was discovered as the entire building was heavily charged with heat and smoke.

HARRY BELKNAP.

Chickens Burn in Chicago Warehouse Fire

Forty thousand live chickens were roasted or suffocated in a fire that destroyed a Chicago warehouse occupied by a firm of commission merchants. The building was five stories high and was constructed of brick. Damage has been estimated at $200,000.

WHAT'S BURNING

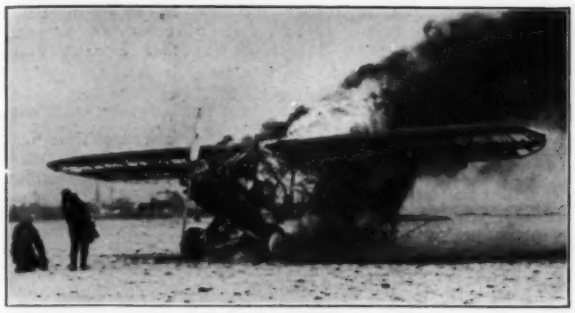
THE following list includes fires of $25,000 loss and over in the United States and Canada, for the periods designated in the headings. These figures, compiled from telegraphic reports, are based on estimates made at the time, and are subject to later investigation and consequent revision. Taken as a whole, however, they give an approximately correct view of the losses incurred. The figures represent loss in thousands.

Week Ending December 27

PHILADELPHIA, PA.—Amusement Center, Willow Grove Park... 150
OWENSBORO, KY.—Plant of Owensboro Grain Co..... 150
WELDON, N. C.—Amer. T. & T. Co. telephone exchange..... 40
ALLENHURST, N. J.—Summer hotel and adj. cottage..... 250
VALLEY CITY, N. DAK.—Store of Right Price Co..... 65
WILSON, ARK.—Property of Lee Wilson & Co..... 65
NATIONAL CITY, ILL.—Wood mill at Swift & Co. plant..... 150
DERRY, N. H.—Ice house of H. P. Hood & Sons..... 30
PILOT MOUND, MAN.—Ogilvie grain elevator destroyed..... 25
GRANITE CITY, MO.—Coudy Lumber Co. plant destroyed..... 125
OAKLAND, CALIF.—Business establishments, Grand Lake dist..... 125
HOUSTON, TEX.—Two oil tanks of Texas Oil Co..... 80
ROLFE, IOWA.—Plant of Charlton & Bower Produce Co..... 30
FT. DODGE, IOWA—Meat market and grocery destroyed..... 25
LONDONVILLE, N. Y.—Home of Wm. B. Kibbee destroyed..... 40
SPARTA, WISC.—Hoffman block destroyed..... 80
FRANKLIN PARK, N. J.—Franklin House destroyed..... 65
KANSAS CITY, MO.—Bldg. at 1912 Grand Ave. damaged..... 45
DENVER, COLO.—Packing plant destroyed..... 25
HORSE CAVE, KY.—Reynolds Tobacco Co. storage whse..... 40
ELIZABETH CITY, N. C.—Lumber dept. of Major & Loomis mill.... 80
NORWAY, MICH.—Rialto Theatre destroyed..... 35
SOUTH BEND, IND.—Portage township school building..... 40
OKLAHOMA CITY, OKLA.—Southmesh Cotton Oil Co. damaged..... 35
OAK HARBOR, OHIO—Thierwachter Milling Co. plant..... 170
RUTHBELL, W. VA.—Sawmill of Caflisch Lumber Co..... 55
LEXINGTON, KY.—Home of former Senator T. Combs..... 70
LINCOLN, NEB.—Grand Leader Dept. store damaged..... 45
ALBERMARLE, N. C.—Morgan Furniture Co. damaged..... 25
QUEENS, L. I., N. Y.—Two 7-story brick buildings..... 90
CHLORIDE, ARIZ.—Chloride Stores Co. building and Arizona Central Bank Building 30

Week Ending January 3

BANGOR, ME.—Factory of H. Goodman & Son..... 25
REGINA, SASK.—Great West Stores, Ltd., damaged..... 30
CHICAGO, ILL.—Factory of Perfection Furniture Co..... 65
HARRISBURG, PA.—Dauphin building damaged..... 65
ELIZABETHTOWN, N. C.—Business property destroyed..... 25
CHICAGO, ILL.—Munger laundry, Indiana Ave..... 80
MONMOUTH BEACH, N. J.—Monmouth Beach Inn. destroyed.. 80
SPENCER, W. VA.—Five buildings destroyed..... 80
SELAH, WASH.—Warehouse of Matson & Co..... 40
PITTSBURGH, PA.—Stores in Stanwix Shops building..... 165
BROOKLYN, N. Y.—Drug store—apartment bldg., Nostrand Ave. 30
McRAE, GA.—S. T. Lincoln department store..... 40
WHITAKERS, N. C.—Several business establishments..... 25
LYONS, N. Y.—Wayne Chevrolet, Inc., building..... 25



Aviators Race to Land Burning Plane Safely

Two aviators were successful in landing a burning airplane at Roosevelt Field, L. I., and escaping uninjured. The photograph was taken shortly after the aviator and a student leaped from the cabin. With the exception of a few motor parts, there was little that could be salvaged after the fire was extinguished.

CAMDEN, N. J.—Broadway building damaged	80
HALSTEAD, PA.—Restaurant and electrical store	25
ANNISTONA, ALA.—Eastahoga school destroyed	25
BLACKVILLE, S. C.—Store of Simon Brown Sons destroyed	50
ELIZABETHTOWN, N. C.—Two stores and garage destroyed	25
ROCKWOOD, TENN.—Commercial building damaged	65
CHICAGO, ILL.—South Chicago grain elevator	800
NEW MADRID, MO.—School building destroyed	40
GROESBECK, TEX.—Gin mill of H. W. Gabriel destroyed	25
SASKATOON, SASK.—Whse. of J. I. Case Threshing Co.	400
RIVERSIDE, ONT.—Riverside United Church damaged	50
DOUGLAS, ARIZ.—Building of South Arizona Automobile Co.	100
LOUISVILLE, KY.—Plant of Standard Gravure Corp.	30
ATLANTIC CITY, N. J.—Arnold Apts. destroyed	300
ELDORADO SPRINGS, COLO.—Dance hall, bath houses, etc.	80
BROWNSVILLE, TENN.—Bond stables, garage and Masonic Hall	35
OSAGE, IA.—Business bldg. owned by Mrs. Whitley	25
WATERLOO, IA.—Business property, Bluff Street	25
LYNDHURST, N. J.—Residential property, 613 Ridge Road	35
EDINBURG, TEX.—Savage Wholesale Grocery Co. bldg.	80
BRYAN, TEX.—Home of G. G. Foster at Brazos Bottom	25
JERSEY CITY, N. J.—Sash and door plant of I. Max & Son	225
BRYN MAWR, PA.—Lancaster Avenue business property	75

FIRE HAZARDS WHICH ARE A MENACE TO THE SHOE INDUSTRY

Need of Cleanliness—Smoking Should be Prevented—Proper Handling of Flammable Liquids—Hazards of Pyroxylin Plastic

IT has been truthfully said that a fire seldom starts in a clean place. With so much scrap and refuse material resulting from manufacturing operations, most of it of highly combustible nature, shoe factories should be kept scrupulously clean. Many fires have originated in rubbish and in material which is left in the factories over night. A safe practice is to have each floor thoroughly swept every working day and the rubbish removed from the factory at night.

Material should not be allowed to collect on heating pipes where it may become overheated and ignited. This is particularly true in departments where there is more or less lint, leather chips or bagging such as that used in the shipping and packing of goods. Special care should be taken to clean around machinery set up close to walls or radiators. Oily rags or waste, leather chips soaked in oil, or oil dripping from machines may frequently cause fires.

A serious cause of spontaneous combustion is ignition of cutting board scrapings. All cutting boards are scraped periodically to make an even surface for the operator. These shavings are usually mixed with linseed oil which is used to dress the board and this forms a dangerous combination which will ignite under certain temperature conditions. All cutters in shoe factories should be impressed with the seriousness of this hazard and the foreman should enforce strict rules relating to the removing of these scrapings from the factory each night. They should be sent to the boiler room direct from the cutting room in metal containers and should not be mixed with other rubbish.

Smoking

Because of the hazardous nature of the materials used in shoe manufacturing, it is not surprising that the foremost cause of fire in shoe factories is smoking by workmen. According to the National Fire Protection Association, more than one-fourth of all shoe factory fires originate from this single cause. To make sure that the operators do not smoke in manufacturing establishments, a careful check should be made constantly and all violators strictly disciplined. In order to prevent the sneaking of an occasional smoke it may be advisable to provide a separate room away from danger where employees are permitted to smoke. Otherwise a number of mysterious fires may occur in the buffing dust blower system where cigarette butts find their way when the superintendent or foreman approaches.

Handling of Flammable Liquids

The operating hazards of shoe factories are increasing daily with the introduction of highly flammable materials, such as benzine, naphtha, ether, pyroxylin plastic and waterproofing material. Each shoe factory should have a separate store house of fire-resistive construction to house all of these materials and the other highly combustible solvents which are generally used in the factory. It is a good practice to install in this separate storage building special storage tanks, equipped with pumps for filling small containers as the material is actually needed for use.

The liquids should be brought inside the building in small approved safety cans for use in the various rooms and then should be removed from the factory each night so there will be no combustible material of this sort left in the building outside of working hours. The use of safety cans not only reduces the fire hazard, but also prevents evaporation, thus insuring a more economical method of using the material.

Where it is not possible to have a separate store house, as in the case of a shoe operator whose factory occupies part of a building in a crowded city district, such materials which have to be kept in the factory should be put in special containers made of heavy sheet steel or boiler plate. Containers are recommended that are made with hinged lids and connected counter-weights for easy operation but with fusible links so that the cover will drop in case of fire. Suitable fire extinguishers could be piped into such containers.

Methods such as the above would reduce losses to a minimum and insure accurate stock-taking methods for keeping and charging out the various materials. It would

The Remains of Profits That Dripped Away

Cold weather, rain and snow, plus the heat of a fire, changed the appearance of an ice house in New York City so that it rivaled the appearance of the famous Luray caves in Virginia. Icy stalactites and stalagmites of unbelievable grandeur were formed amid the ruins.

also reduce the fire hazard as it eliminates hazardous ways in which solvents are often stored and handled.

Benzine, ether, rubber cement, gasoline and similar volatile liquids should never be used where open flames can ignite the vapor. Many of the fumes of these liquids are heavier than air and escape to the floor below where flames may ignite them. For this reason it is advisable to install ventilating systems to remove the vapors where large quantities of liquids are employed.

Static electricity has caused fires especially around cementing machines where the vapor from the rubber cement has been ignited. These machines should be cleaned every day to remove extra material which is spilled on benches and floors. It is believed that if such machines are grounded a considerable amount of static will be prevented.

Water-proofing compounds are being introduced which use highly volatile liquids as solvents for dissolving oils and waxes. They are usually applied by the dipping process. This necessitates the exposure of large surfaces to evaporation and fire hazard. Tanks used in water-proofing and similar processes should be protected by automatically operated fire-extinguishing apparatus.

Pyroxylin Plastic

Pyroxylin plastic is now an important material for shoe manufacturing. It is used in many forms, either in sheets for covering wood heels or box toes material, or in the liquid forms such as in cement, lacquers and similar products. The storage of this material is an important matter as a hazardous condition may exist wherever it is used. The stock should be kept in small bundles and stored in metal containers wherever possible. Care should be taken to remove all pyroxylin plastic waste and chips each evening. It is dangerous to ignite this material with other flammable products so the waste should not be mixed with leather chips or cloth lining to be burned in the boilers. Many solvents are used in connection with pyroxylin plastic products which appear in numerous forms in the factory. The solvent is usually kept in small containers. These containers should have weighted covers on them so they will be shut when not in use. This will eliminate any possibility of fires spreading from ignition of this material.

Skiving machines sometimes produce sparks which start fires, especially when pyroxylin plastic or other flammable materials are being used. All operators in grinding their knives on these machines create sparks which in turn ignite the dust collecting in the bottom of the skiver and materials surrounding the machine.

Drying and Heating

Many types of dryers are being introduced in shoe factories today. The older type of equipment was heated by gas (edgesetters, expedite machines, stampers, etc.), but today electricity is coming into general use for this purpose as it gives uniform temperatures. The dryers should be kept free from dirt and dust at all times, especially on their hot surfaces so that it will be impossible to obtain combustion. All open gas jets should be eliminated wherever possible.

Electric heating circuits should be protected by pilot lights and switches arranged so that electricity is cut off the heating circuit each night. Many fires have started through leaving the current on flat irons or other heating units after working hours.

Tom and Dick and Jerry are Still on the Job

Fire horses have not entirely disappeared from the fire departments in sections where winter means minus zero temperatures. They are used in Quebec, Canada, during the period of heavy snowfalls. Some of the equipment is mounted on sleds and is drawn by horses. Temperatures of thirty degrees below zero are not uncommon.

Blower Systems

The exhaust or blower system in the average shoe factory is a possible source of fire or resulting dust explosion because leather dust collecting in the pipe can become ignited when a spark is drawn into it. Sheet metal construction should be used in dust-collecting systems. Wherever possible, it is advisable to run the dust-collecting system on the outside of the building, connecting to the machines with smaller pipes passing through the wall of the structure. Clean-outs should be provided at frequent intervals in the pipe so that in case a fire should originate a hose or fire extinguisher can be discharged into the line and extinguish the flame. The dust collectors or separators should be erected on the outside of the building and located in such a way that they will not create a hazard to surrounding structures. Adequate means should be provided for emptying these collectors each day and the dust either burned or shipped away as rubbish. Polishing wheels sometimes discharge cloth, wax, lint and other materials which tend to stick in the pipes and cause them to clog. This will collect leather dust and in time may create a stoppage in the pipes. A dust-collecting system should be inspected periodically to see that it is in good operating condition. The exhaust fans themselves should be of either ring oiling or ball-bearing design to eliminate any possibility of a hot box starting a fire. The positive pressure type of an exhauster is recommended as they are commonly constructed with the bearings outside of the fan casing.

There are some instances in shoe factories where it is not advisable to discharge particular machines into the dust-collecting system. An illustration of this is the trimming of hard rubber top lifts. The trimmings from these top lifts are heated during the operation of trimming to such a temperature that they can ignite leather dust. Therefore it is advisable to discharge these machines into a separate dust-collecting system independent of the main line.

Disposition of Waste

Every shoe factory creates considerable waste products, the disposition of which is an important item in eliminating fire hazard. The waste consists of small leather scraps, cuttings, trimmings, cloth, lining, pyroxylin plastic, rubber cement, etc. Sweepers should be employed to gather this material as fast as it accumulates each day. Separate containers should be used so that lasting tacks and wires, needles and other metallic substances will not be mixed with the combustible materials. All sweepings which are not sold as offal and have no salvage should be sent to the boiler house immediately for burning under the boilers or carted to the dump. The salvable material should be bagged up or baled and stored in a separate building from the main factory to eliminate any possibility of combustion starting in this refuse. All oily waste and rags used for wiping machinery should be kept in a special safety can provided for the purpose. Where chutes are provided in buildings for the delivery of waste to the boiler room, openings should be equipped with metal doors fastened by means of fusible links.

Much of the foregoing information has been taken from a Fire Prevention Bulletin issued by the National Fire Waste Council.

Suggestions on Boston's Fire Force

(*Continued from page* 18)

venience of those governed by it; reduction of the permissable height of frame and unprotected wood-interior dwellings; provision of an intermediate type of light fire-resistive construction for appropriate occupancies; inclusion of definite egress requirements for all types of buildings."

Political Interference with Fire Department Scored

Severe criticism of conditions which permit political interference with the fire department, as well as criticism of its entrance requirements are found in the report.

"Next to that of building construction the fire department is the most important factor in Boson's fire loss record. The improved efficiency of the department in the past few years has been to a considerable extent responsible

for the material reduction of 1927 and 1928 losses. Similarly its deficiencies in other years have helped to establish Boston's deplorable record.

"The instability of the office of Fire Commissioner has made and will continue to make under present conditions a political football of this position which is of paramount importance to the well being of the city.

Improved Entrance Requirements Urged

"Because of unwise entrance requirements the Fire Department is not attracting the highest grade of personnel, and adequate retirement provisions are lacking. The best men in the department are held to the level of the poorest."

The average age of men in the department was found by the survey to be 40 years, which the report declared to be too high. Recommendation is made that the maximum age limit for admission to the department be reduced from 35 years to 25 years.

Suggests Formation of Technical Division

Finding a lack of men with technical or engineering education, the report recommends the establishment of a technical division headed by an experienced and technically trained fire protection engineer, and that he be assisted by a staff of at least five junior engineers.

The importance of technical methods of attacking fires and of fire prevention is stressed in this recommendation. The technical division which the report suggests be established would have the duty of studying the technical aspects of fires, maintain and analyze fire records, plan inspection work, develop new fire fighting and fire control methods, and conduct the necessary research necessary to intelligently project the future development of the department.

Need of More Inspectors Pointed Out

Grave defects in fire prevention inspection work were discovered by the survey's investigators. One of the major recommendations in this respect includes the addition of 30 inspectors to the present staff of the fire prevention division of the fire department, and that of the staff of 54 thus formed, 42 be assigned to an "inspection patrol" to inspect critically certain specific areas which have had high fire losses. It is further recommended that these men inspect every building in the designated inspection areas not less than once a month and preferably once every two weeks, and that the men be rotated from district to district.

Defects Shown in State Fire Laws

Defects in the application of the state fire laws are responsible for a considerable portion of the city's fire losses, the report states. The Preble Box Toe Company disaster of a year ago, in which twenty lives were lost, is cited as an example. In this case, where the explosion of inflammable gases caused one of the worst disasters in the state, confusion of the fire laws caused both state and local officials to decline to take responsibility for the enforcement of regulations designed to control just such hazards as were responsible for the fire.

"The present laws on fire control make for frequent confusion and friction between state and municipal authorities as well as general misunderstanding on the part of the public," says the report. This is given as one reason why the fire laws are not more effective in preventing fires and their ensuing losses.

The report praises the general procedure for the preparation of regulations covering special fire hazards, but finds many defects in the regulations themselves.

Detailed Regulations for Fire Hazards

The Department of Public Safety has the duty of drafting detailed regulations for many fire hazards such as gasoline and oil storage, et cetera. The report praises the general law placing this responsibility on the Department of Public Safety because the experts of the Department are judged better qualified to pass on technical details than general legislative bodies.

The regulations so issued, however, are found to be confusing and in many cases entirely unsatisfactory. No regulations at all have been drafted for many important sources of fire danger, and others have been created only after a disaster has called attention to their need.

No specific regulations have been drawn for such fire hazards as gasoline and oil tank trucks, paint spraying, compressed gases, and industries in which dust explosions are likely to occur. Regulations covering mechanical refrigeration are said to be poorly drawn.

The report lists forty-six special fire hazards and classifies their regulations as "adequate," "fair," "poor," or "no regulation." Only six in the entire list are classed as "adequate." Twelve are said to be "fair." Others are either poorly regulated or not covered at all. Others are called obsolete, though it is admitted they might have been adequate at the time of their creation. In this respect it is charged that the regulations have failed to keep pace with modern developments in business and industry.

In order to eliminate the condition of divided responsibility which has led to a "confused relation between the Boston Fire Department and the State Department of Public Safety which reflects no credit on the state authorities and has continuously resulted in impairing the efficiency and morale of the Fire Department's inspection service," a complete revision of Chapter 148, General Laws, is recommended.

Changes in Arson Laws Recommended

The report recommends changes in the arson law, and includes a statistical study which indicates that arson increases as business conditions tend to become depressed. Defects in the arson laws, the report finds, make it exceedingly difficult to secure convictions.

In reference to state matters the report makes a strong recommendation "that a competent person be appointed State Fire Marshal, preferably a man with engineering or technical education and experience."

Careful Analysis of Fire Losses in Report

The survey staff, in obtaining the facts on which the committee has based its recommendations, has subjected the Boston fire record and the entire Boston fire problem to a microscopic analysis. The facts and figures are presented in a 300 page report with more than 150 tables, charts and illustrations. Fire insurance rating practices have been investigated in detail, schedules used for rating thoroughly analyzed, and figures secured showing the total amounts collected by the insurance companies in premiums and the amounts paid back to policy holders for indemnity on fires. The average fire losses during the five year period 1923-1927 have accounted for about 54 percent of the premiums collected.

What there is to burn in Boston is described by maps showing building construction by types and character in every part of the city. This was supplemented by field inspections of blocks typical of the general construction in any one district. Frank Burton, a leading consulting engineer on building laws and for many years head of the building department of Detroit, was retained to analyze from the unbiased viewpoint of an outsider the effect of Boston's building laws on building construction.

Boston's fire record has been analyzed in detail. The 65,000 fires and alarms which occurred in the ten years 1918 to 1927 inclusive have been tabulated and classified, and the 7,332 fires in the single year of 1927 studied in detail. This material has been supplemented by the study of all obtainable details of every fire in the five years 1923-1927 in which the loss exceeded $15,000. These fires account for about 60 per cent of all the fire losses in Boston.

Losses have been classified by specific occupancies and according to the district where the fire occurred. These studies were productive of most important facts as they showed that certain classes of business and certain districts of the city were responsible for a disproportionate share of the city's losses.

The committee and staff report entire cooperation from all agencies affected by the survey, particularly from the heads of state and city departments, the Boston Board of Fire Underwriters, and other insurance organizations.

Fire Alarm Bill Introduced—A bill is now in the Massachusetts legislature to require asylums, almshouses, hospitals, schools and orphanages to be equipped with fire alarm boxes.

Ellsworth, Me., Buys Apparatus—Ellsworth, Me., has purchased a 600-gallon McCann pumper equipped with a booster tank.

Davenport Firemen Repair Toys—Members of the Davenport, Ia., fire department have repaired and redecorated discarded toys for redistribution to the poor children.

Span and Sag in Fire Alarm Cables

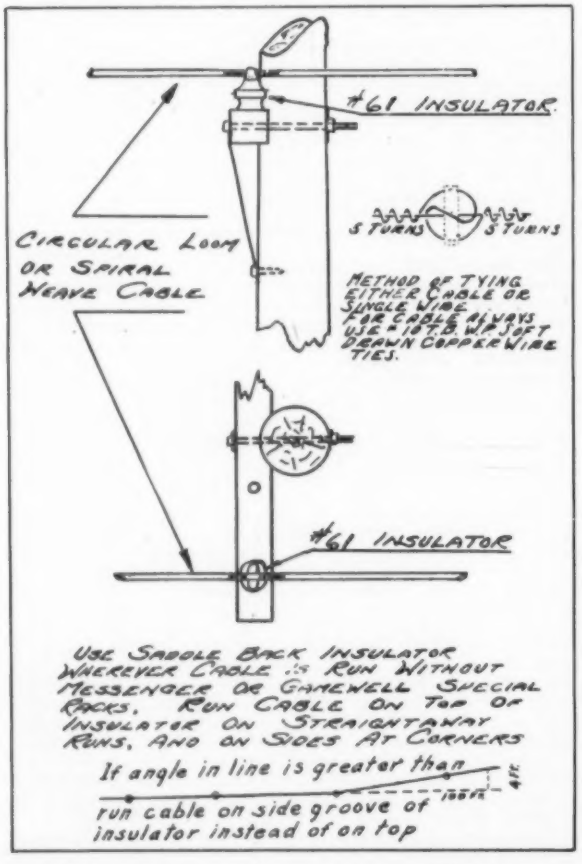
(*Continued from page* 14)

as that existing within a 99 foot span pulled up so as to have the proper sag of 20" we get the following expression:

$$120 \text{ Pounds} = \frac{.16 \times L^2}{\frac{8 \times D}{12}}$$

This expression can be simplified to read as follows:
$D = .002 \times L^2$.

Which means that a safe value of sag in inches equals .002 multiplied by the distance between poles in feet squared. This calculation as well as all preceding ones, is based on a temperature of 65 degrees Fahrenheit. It is, of course, evident that due to the contraction of copper within the cable as temperature goes down and its expansion as temperature rises it would be permissible to


#61 INSULATOR
CIRCULAR LOOM OR SPIRAL WEAVE CABLE
5 TURNS
5 TURNS
METHOD OF TYING EITHER CABLE OR SINGLE WIRE. FOR CABLE ALWAYS USE 2 PCS. OF SOFT DRAWN COPPER WIRE TIES.
#61 INSULATOR
USE SADDLE BACK INSULATOR WHEREVER CABLE IS RUN WITHOUT MESSENGER OR GAMEWELL SPECIAL RACKS. RUN CABLE ON TOP OF INSULATOR ON STRAIGHTAWAY RUNS, AND ON SIDES AT CORNERS
If angle in line is greater than
run cable on side groove of insulator instead of on top

allow slightly more sag on a very warm day and slightly less on a very cold day. The margin of safety, however, in the use of cable in accordance with the preceding formulae is great enough so that no serious troubles will be encountered if temperatures are disregarded excepting in extreme situations. As a general proposition it is advisable to avoid erecting this cable in extremely cold weather. Making use of the above formula one can compute tables for spans of any lengths. The following table has been computed for a few spans which are likely to be encountered in practice:

Distance Between Poles	Proper Sag @ 65° F.
82.5 feet	13.4 Inches
88 "	15.4 "
93.5 "	17.3 "
99 "	19.4 "
104.5 "	21.6 "
110 "	24 "
115.5 "	26.4 "
121 "	29 "
126.5 "	31.5 "
132 "	34.5 "
137.5 "	37.4 "
143 "	40.6 "
148.5 "	43.7 "

It is, of course, evident that it becomes impractical to use this cable for spans much in excess of 125 feet because of the excessive sag which must be provided in order to allow safe tensional loads in the cable unless messenger support is to be provided.

I wish to repeat that the figures presented herein apply only to 4/c cable, but the formulae and the method of attacking the problem are applicable to cable of any size.

Method of Supporting Circular Loom Cable

The proper method of supporting circular loom cable both at dead end points and at intermediate points has presented occasional troubles. I have, therefore, brought with me some of the fixtures which seem to be particularly well adapted for use with this cable. At intermediate supports a saddle back insulator can be used with safety both on straightaway runs and at corners, the cable being tied in the top groove by No. 10 soft drawn, triple braid copper wire where the cable run is straight and tied in the side groove wherever appreciable angles exist in the line. Where racks are desired we have found that the Hubbard No. 183 rack is particularly well adapted for use at corners, and where appreciable angles exist in the line. Where the runs are straight, the special Gamewell rack serves the purpose best because there is no possible chance for the cable to get away. The real problem comes at dead end points because the very make up of circular loom cable is such that it ought not to be bent sharply around insulators of small radii. If some care is not exercised in dead ending circular loom cable, the bend which results actually breaks the sheath and gradually lessens the life of the cable. There is no reason whatever why these breaks should occur. One method of avoiding them is to utilize a long radius strain insulator like the one the Gamewell Company uses. This enables a lineman to dead end the cable without a sharp bend of any kind and if No. 10 soft drawn, triple braid wire is properly tied around the conductors where they are dead ended there is not the slightest probability of the cable becoming loosened. The accompanying diagrams illustrate the use of these supports.

In closing I wish to state that our experience in handling cable of this class has been very satisfactory and we have found that it has increased the economy of installations particularly where a limited amount of crossarm space is available, and in situations where it becomes quite a problem to find room through the trees to run separate conductors.

G. C. Neal, State Fire Marshal, Dead

State Fire Marshal George C. Neal, of Massachusetts, died at his home 17 Beacon Hill Avenue, Lynn, on Dec. 14 after a brief illness of pneumonia. He was 87 years of age.

He was a veteran of the Civil War, having served in Co. K, of the 33rd Massachusetts regiment. He was a noted detective in the state police before being appointed state fire marshal in 1905. He secured restrictions in the sale of dynamite and inaugurated the campaign for a "Safe and Sane Fourth of July" in Massachusetts.

Governor Allen and prominent state officials attended the funeral. There was an escort of ten mounted officers of the state police and nineteen patrolmen.

The honorary pall bearers were John H. Plunkett, chief of inspections; Timothy C. Murphy, acting fire marshal; Capt. Charles T. Beaupre, of the state police; Capt. Thomas E. Bligh, chief of detectives; George O. Mansfield, acting chief of fire inspection; Fire Inspectors Edward F. Horrigan, Edward H. Murtagh, and Thomas A. Thompson; and Fred A. Hutchinson, of Lynn, who represented the General Court. Burial was in Pine Grove Cemetery.

HARRY BELKNAP.

Firemen May Claim Compensation

According to a ruling handed down by the California Industrial Commission, a fireman injured in line of duty may claim compensation in addition to whatever pension benefits are provided.

The case was brought up by an Alameda, Cal., fireman who was injured while fighting a roof blaze. Upon becoming incapacitated he applied for compensation but instead was granted a pension allowance during his enforced absence from duty. A renewed demand for compensation was rejected on the ground that the pension allowance was inclusive.

It was the plaintiff's contention that the application for compensation must be considered independent of a pension regardless of whether or not a city pensions its employees. This contention was upheld in the Board's ruling.

Fund Raised for Worcester Widows—A fund of nearly $10,000 has been raised in Worcester, Mass., for the benefit of the families of two officers who lost their lives in a recent fire.

The Round Table

(*Continued from page* 16)

saves a great deal of unnecessary damage by water streams.

J. H. Espey, Chief, Elmira, N. Y.: It is essential for men to be drilled in the laying of hose lines, raising ladders, the use of shut-off nozzles and the operation of different makes of extinguishers and chemical tanks. It is also very important that men have a knowledge of first aid methods due to the many times the department has to respond to calls to automobile accidents.

Emil Johnson, Chief, Boulder, Colo.: Fire departments should have regular drills in raising and lowering ladders and, in fact, in the use of all equipment carried on the apparatus. These drills not only keep the firemen physically fit for fire fighting, but they also teach them how to use the equipment properly. This is very important in a small city where there are not so many fires.

Fred J. Washburn, Chief, Auburn, N. Y.: It is important that men should be instructed how to lay lines of hose. They should also be drilled in the proper use of all tools and equipment employed by the department. A knowledge of the location of all hydrants and the various streets of the city is also essential. Such drills prepare the men for more efficient work and enable them to act quickly when emergencies arise.

Chas. P. Loller, Chief, Hamden, Conn.: In a small town having a volunteer department, the most essential thing is training the men to connect to hydrants or how to draft from ponds. I find there is a lack of such knowledge in small departments.

Wm. Berger, Chief, Fremont, Ohio: Men should be instructed on how to connect suction hose to engines, hydrants and also sprinkling systems. They should be taught how to use ladders properly. Smoke mask drills are also very essential. Inspection work is also good training for the men. This acquaints them with the various fire hazards.

E. P. Bailey, Chief, Fairfield, Iowa: Members of fire departments should be drilled in the proper use of all equipment and apparatus used by the department in order that efficient work is accomplished at fires.

P. J. Thomas, Chief, Berlin, N. H.: I believe that drills in the proper use and care of fire tools, appliances and ladders are most essential, as much time is saved at a fire if men are familiar with the proper use of all tools. Time-saving is a big factor in fire control in a small city where companies are generally undermanned.

C. A. Borum, Chief, Aberdeen, Wash.: A thorough knowledge of all the equipment with which the men have to work is very essential. For this reason drills should be performed regularly. The men should know how to lay fire hose, raise and lower ladders, and use all of the other small equipment employed by the department. A knowledge of first aid methods is also essential.

Floating Oil Barge Endangers Traffic

Sunday automobile traffic was held up for over two hours while a burning oil barge drifted near the bridge of the Paterson Plank Road in New Jersey. The fire was started by an explosion on the boat and two men received severe burns. The photograph, taken from an airplane, gives an indication of the seriousness of such a hazard.

John C. Neney, Chief, Barre, Vt.: Firemen should be drilled in the proper use of ladders and hose lines. This is necessary in order to save life and property.

D. A. Kincade, Chief, Independence, Mo.: Men should be drilled in the operations they are actually required to perform. This would include laying hose lines, climbing ladders and operating pumps with high and low pressure.

Geo. M. Bower, Chief, Rome, N. Y.: Men should be drilled in the proper connecting and laying of hose lines. In a small department this work is done more than anything else.

W. R. Funke, Chief, Centralia, Ill.: Members of fire department should be instructed in the use of all apparatus used in their work. One of the essential things is that the men know how to properly couple hose to hydrants.

Answers to Previous Questions

C. A. Reynolds, Lieut., Willimantic, Conn.: This department has been operating under the two-platoon system for the past eight years. The shifts are arranged as follows:

Day platoon starting at 8 a.m. and running until 6 p.m. for three consecutive days. On the fourth day, the day platoon does duty from 8 a.m. until 8 a.m. of the fifth day, at which time the oncoming crew starts working the same as the ten-day platoon did. The day shift is ten hours and the night shift fourteen hours, each platoon working twenty-four hours every eighth day.

We have always worked under the day and night shift plan and find it very fair. We consider it the better plan.

D. C. Rainwater, Chief, Anniston, Ala.: We do not operate under the two-platoon system. Our men are on duty for twenty-four hours. I personally consider the twenty-four-hours on and twenty-four-hours off shifts the better arrangement.

Setting a Standard for the Fireman

The following, from William Meinheit, Assistant Chief of the Berkeley, Cal., Fire Department, sets a high standard for the professional fireman to follow. He will not go far wrong if he adheres to the principles set forth in this ethical program:

He Will Qualify as a Professional Fireman,

Who keeps himself physically, mentally and morally fit; who is obedient; who has the grit and tenacity to hang on under trying conditions and who has the moral courage to stand by his honest convictions;

Who is an expert, thoroughly familiar with the various details of his business, but who also respects the experience and knowledge of his associates;

Who subordinates his own immediate desires and profits to the department's needs and welfare and who maintains his own sense of proportion in respect to his importance;

Who would not stoop to underhand methods or tactics for personal gain and who willingly puts service ahead of self;

Who realizes the necessity, reason and sensibleness of rules and regulations to the end that he will justify and not criticise them;

Who realizes that factions should not exist in the organization and will work towards the end of defeating their inception by refusing to become a party to them;

Who will not align himself with any group or organization which may affect his loyalty, responsibility and obligation to the department and the regular constituted municipal government and who will openly stand with the department and defend it against unwarranted attack by chronic fault-finders, disgruntled and dissatisfied politicians, disruptionists and like elements;

Who feels that simply taking everything and giving as little as possible in return is the wrong road for continuity of service and advancement and who realizes that usually there is no material reward without hard work;

Who appreciates that wages and compensation are never right if the quality of service rendered is wrong;

Who makes it his business to see that everything practicable is done to lessen and reduce department expenditures without sacrificing the essentials;

Who realizes that firemen have not the right to jeopardize public safety at any time, at any place, or for any reason;

Who will work towards the end of making the department honest, clean, efficient and responsive.

Williston Park Defeats Bond Issue—The trustees of Williston Park, N. Y., withdrew the plan to issue $30,000 bonds for the construction of a fire house. The matter is to again be brought up at an early date.

Change in Massachusetts Rules—Governor Allen of Massachusetts has approved the following change in civil service rules affecting police and firemen: "The examining physician shall make a report of the physical condition of the applicant and the Board of Commissioners shall have discretion to accept or reject any applicant in accordance with the degree of disability found to exist. This applies to police and fire as well as to all other applicants."

INDUSTRIAL PLANT PROTECTION

TAKING PRECAUTIONS AGAINST FREEZING OF FIRE EQUIPMENT

Sufficient Heat Should Be Provided—Pipes Should Be Carefully Protected—Alarms and Fire Pumps Should Be Tested—Fire Drills

As the winter season is here it is advisable to have a careful inspection made of all fire protection equipment and necessary precautions taken to safeguard it during the cold weather. The following general suggestions are therefore made in the hope of assisting property owners in this important matter. While some of the suggestions may not apply at every plant we believe the information will be of value to all, to the end that your fire protection system and other apparatus may be maintained in full commission at all times ready for any emergency.

Unless proper precautions are taken in advance of the winter season the very best fire protection equipment may be absolutely thrown out of commission in some vital spot on account of freezing. A very small "freeze-up" may destroy the efficiency of a large equipment. Neglect of proper precautions has been the direct cause of a number of very heavy losses in past winters.

Preliminary Inspection

A thorough preliminary inspection is very essential. It should be made by one who is fully acquainted with the location and purpose of every valve, pipe, or other apparatus. Nothing should be taken for granted. Eternal vigilance is the price of complete protection, therefore each detail should be carefully followed up throughout the winter.

Precautions to Be Taken

1—We wish especially to urge the installation of adequate heating facilities (or dry pipe system if heating is not practicable) for buildings in which water in sprinkler piping is liable to freeze, and which for this reason would be shut off during the coming winter.

Only by maintaining the entire sprinkler system in full commission throughout the year can you guard yourselves against damage to apparatus and property and furnish constant protection for yourselves.

We recommend that this matter be given early attention in order that these sections may be under constant protection.

Provide Sufficient Heat

2—Be sure that all portions of heated buildings are adequately heated, so that no piping can freeze. Provide additional heating facilities where necessary. Temperature should be maintained above 40° Fahr. at all times.

3—Examine carefully and provide suitable heating for any pipe lines which may be in an exposed location (such as in passages, bridges, entries, stair towers, elevators, etc.).

4—Boxing should be provided around any pipes between ground and first floor, between buildings, or near windows, doors, etc. If such pipes now have boxing, be sure no open joints or gaps exist.

Test for Frost

5—Make frequent tests at such places during the winter to be sure these pipes are free from frost.

6—All broken windows and skylights should be repaired and all doors to outside made thoroughly weather-tight. Any outside ventilators to attics should be closed tightly.

7—Examine carefully all pipes, valves, and fittings, whether for steam heating, general water service, or fire protection and be sure that none are frozen or have been partially frozen and split and that they all are in operative condition.

8—Where there is any possibility of freezing provide the necessary protection.

9—Place thermometers in the colder rooms of the plant and keep close watch of temperatures during the cold weather.

10—Existing dry pipe systems should be carefully examined to make sure that all piping is properly pitched to drain back to the dry pipe valve. If any "traps" are found they should be eliminated, else water from condensation will collect and freezing occur.

11—Where "traps" cannot be done away with, drip valves should be installed at low points, and tested frequently during cold weather. (These outlets should be plugged to prevent possible tampering or air leakage.)

12—See that all dry pipe valves are in proper working order, with air on.

13—Closets for dry pipe valves should be properly constructed and permanently heated, preferably by steam or electric heater. Lanterns or oil stoves should not be used for this purpose, unless in extreme emergency and then should be carefully and constantly supervised.

Testing Alarms

14—Alarms on dry pipe systems should be tested frequently to make sure they are in operative condition. Should a dry pipe valve trip without sounding the alarm, it would admit water to the system, where it would freeze with disastrous results.

15—Tanks should be cleaned, where necessary, and supports repainted. Inspect expansion joints and riser boxing.

16—Tank heating systems should be examined and tested to be sure they are in proper working order, including all valves, traps, etc. Tank heaters and circulating pipes should be cleaned or flushed to remove rust or sediment. *Turn on steam* before extreme cold weather.

17—See that all valves which should be open are *wide open*, and try water outlets to ascertain that all pipes are free and ready for service.

Note—By-pass valves for filling tanks, reservoirs, and standpipes *should always be kept closed* except during the actual filling operation. This is absolutely necessary in order to secure high pressure on system in time of fire.

18—An ample supply of extra sprinklers (at least 24 ordinary degree heads and 6 of each higher degree type used) with special sprinkler wrench should be on hand in an accessible location for emergency use.

19—An assortment of extra fittings and plugs is desirable to facilitate quick repairs.

Test Fire Pumps

20—Make *actual test of all fire pumps* through lines of hose attached to hydrants, running pumps to *full capacity*. Any necessary repairs should be made promptly.

21—Make sure that pumps are fully manned and are in proper condition, with discharge valves open, for *immediate use in case of emergency*. To be of greatest value the fire pump should be brought into service at the start of a fire, and thus prevent it from having a chance to spread.

22—Priming tanks should be full at all times, lubricators full of oil, and all other accessories in order.

23—At least 50 pounds of steam should be maintained for steam fire pumps at all times, and of ample volume to operate pump at once to full capacity.

24—With electrical fire pumps, all apparatus, wiring, and connections should be gone over thoroughly and tested.

25—Give special attention to heating of pump rooms. Be sure temperature never gets low enough to cause danger of freezing.

26—Examine the ends of pump suction pipes and see that cribs are clean and strainers clear of refuse. In many cases the capacity of pumps has been greatly reduced by obstructions.

27—Try all hydrants, including hose valves, while under fire pressure, to see that they *open and close easily*, and lubricate where necessary. *Be sure all hydrants drain.*

28—Try all Post Indicator Valves in yard system to see that they open and close easily. Repack stuffing boxes and lubricate where necessary. Make sure that indicators show the actual condition of the valve.

29—Hydrants and hose houses, post indicator valves, valve pits, etc., should all be kept free from ice and snow and accessible at all times.

30—Put hose houses and equipment in order, re-laying hose so that old creases or folds are straightened out. This will add to the life of the hose. Clean and fill lanterns.

31—Be sure your engineer and night watchman are thoroughly posted as to purpose and intent of every valve and pipe, understand completely how to operate fire pumps and know just what to do in case of fire.

Note—Your watchmen should be able-bodied, vigorous, and intelligent men of good character. The importance of their position and their responsibility makes this imperative.

Fire Drills

32—The weekly drilling of your men in the use of all fire apparatus is not possible in many cases during the winter

months, nevertheless a well drilled and interested department is equally valuable at all times. To maintain the interest in the fire protection system and to keep the department ready for any emergency it is suggested that regular meetings be held at which the men be instructed in the location of the sprinkler control valves, operation of fire pumps, use and maintenance of first aid appliances, and the more hazardous processes which may involve special methods in order to effectively fight fires in their vicinity.

If a reorganization of the department is necessary now is the time to start on it.

Fire Drill

33—Water pails and casks in cold buildings will surely freeze and be useless in time of fire. Calcium chloride may be added to the water to prevent this.

Extinguishers

34—Two and one-half gallons extinguishers (foam and soda-acid types) should be removed to heated rooms or enclosed in heated cabinets. These should be emptied and recharged yearly, but calcium chloride should not be added to solutions as it makes these extinguishers absolutely inoperative.

35—One quart extinguishers (carbon tetrachloride) will not freeze.

36—Extinguishers of the anti-freezing type give an effective stream at temperatures as low as 40 degrees below zero (Fahr.). These extinguishers are recommended for all locations where freezing temperatures are reached.

Heating System

37—A thorough examination should be made of the entire heating system before putting it into service. All heating pipes should be carefully brushed down, and where the piping is located along walls, any rubbish or litter which may have accumulated should be removed and pipes kept free from dangerous contact with walls, partitions, etc. Thoroughly clean all boilers and flues before winter arrives, thus increasing their efficiency. This is especially important where low pressure boilers are used for heating.

Fuel Reserve

38—Obtain the largest possible supply of coal as early as possible. *Set aside enough to warm the plant for at least two or three weeks and hold this for emergency use even should it become necessary to suspend operation of the plant for lack of coal.* Such a reserve is one of the best forms of insurance against damage to or entire loss of property by fire. Coal should be stored by approved methods outside buildings if possible.

oughly cleaned and put in good order, as obstructions, such as lumber or miscellaneous yard storage, interfere seriously with handling hose streams at night or where there is a considerable snow fall.

40—To thaw water pipes that have been frozen, wrap the frozen section with cotton cloths and pour hot water upon it until the ice gives way. If the freezing is too severe to yield to this treatment, the piping should be taken down and thawed out, in which case follow precautions outlined in section 43 below. (Good results have been secured by use of electricity where proper apparatus was available.)

41—Never attempt to thaw piping by using a torch or open flame of any kind.

42—Never wrap pipes with oil soaked cloths and set them on fire. Such a method is simply incendiarism.

43 a—Take steps immediately to restore full protection.

b—If extensive repairs must be made in branch mains, plug the main where disconnected and turn water on. Do not remove plug until repairs have been completed and final connection can be made. By doing this, protection can be maintained on all but the disconnected portions.

c—Station a competent man at each valve that must be closed so that valve may be opened immediately if a fire occurs.

d—Extra watchmen should be stationed in rooms where water is off, equipped with ample supply of fire pails, 2½ gal. or 1 qt. hand extinguishers.—*From circular issued by Factory Insurance Association, Hartford, Conn.*

Bristol, Conn., to Relocate Fire House—The Uncas fire station in Bristol, Conn., is to be relocated, and the present property has been sold.

Hultman Suggested for Fire Marshal—Eugene C. Hultman, fire commissioner of Boston, is being considered for fire marshal of Masachusetts by Governor Frank G. Allen. The vacancy was caused by the death of George C. Neal, State Fire Marshal.

Many Apply for Youngstown Examination

Two hundred candidates for appointments to the fire department in Youngstown, Ohio, took the examination required of all applicants.

Thirteen of the successful candidates will be appointed to the department as cadets. The city budget provides for that many new men for 1930, and if they will agree to work until January 1 without pay, they will be named at once to replace men injured in the Cities Service Company fire.

Pyromaniac Busy in Oakland

An intensive search has started for a pyromaniac in Oakland, Cal., who set fire to Fremont High School, the oldest educational unit in the city, and who a few hours later attempted to burn the Lockwood Junior High School by means of a bomb.

The incendiary is believed to be the same whose activities have reduced to ashes a dozen schools, churches and public buildings in Sonoma, Mendocino, Lake and Suisun Counties in the past few months. Although he was seen in the act of throwing a fire bomb which set fire to the steps of the Lockwood school last night, darkness concealed his features, and authorities were without a clue to his identity.

A San Leandro fireman returning to his home from the Fremont High School fire saw a blue sedan draw up to the curb in front of the Lockwood school, and the driver hurl a package against the front entrance. The package proved to be a boom, which exploded and set fire to the front steps. The fireman turned in an alarm and then gave chase to the incendiary, but the firebug escaped.

Chief Remy of Mansfield, Ohio, Resigns

William H. Remy, head of the fire department in Mansfield, Ohio, and one of the best known chiefs in the state, tendered his resignation.

He has been associated with the department in various capacities for the past twenty-eight years, and was named chief in 1915. Chief Remy is a past president of the Ohio Fire Chiefs' Association and is now a member of the executive committee of that association.

Chief Remy plans to move to Texas to enter some business there. His successor has not been named as yet.

Frank J. May, a member of the department for sixteen years, has been appointed to succeed Chief Remy

Lester Named Chief of Athens, Ga.

E. F. Lester, acting fire chief, has been unanimously elected head of the fire department in Athens, Ga. He has been working with the department for the past eighteen years. He acted as chief during the illness and since the death of the late Chief Watson.

For four years Lester served as private in the department and then six years as driver. He served as lieutenant for three years, four and a half years as captain and about three months as assistant chief.

The new chief stated that in the future he plans to fight fires by preventing them before they start and that he would seek the cooperation of the residents.

There has been an adjustment in fire department salaries. Back in 1925 the city experienced a number of business and bank failures, and the salaries of members in the department were cut ten per cent. In 1928 the city gave back to the firemen five per cent. of this cut and on January 1, 1930, salaries were raised five per cent., bringing them back to the level of 1925. Firemen now receive $125 a month.

Beacon Falls, N. Y., Expecting Apparatus—Beacon Falls, N. Y., is expecting the delivery of a new Seagrave apparatus.

Alhambra, Cal., to Erect Fire Station—Ground has been broken in Alhambra, Cal., for the erection of a fire station.

Delaware, O., Starts Two-Platoon—Effective January 1, the two-platoon system was sarted in Delaware, Ohio. The men will be on duty on alternate 24-hour shifts.

Shelby, O., to Buy Apparatus—Shelby, Ohio, has opened bids for new fire apparatus. The prices ranged from $10,500 to $14,400.

Springfield, Mass., to Buy Apparatus—The council of Springfield, Mass., has appropriated $12,000 for the purchase of fire apparatus.

Plainfield, N. J., Awaits New Apparatus—Chief Dunn and the Fire Commissioner of Plainfield, N. J., visited Allentown, Pa., to inspect the Mack pumper now being constructed for the city.

FIRE DEPARTMENT ACTIVITIES

Pumper Delivered to Williams, Ia.—A pumper has been delivered to Williams, Ia.

Center Junction, Ia., Has Chemical Car—The chemical car ordered by Center Junction, Ia., has been delivered.

Carbondale, Ill., to Buy Apparatus—Carbondale, Ill., has invited bids for supplying fire apparatus.

Ferndale, Wash., to Buy Apparatus—The council of Ferndale, Wash., voted to purchase fire apparatus.

Campbellsport, Wis., to Buy Apparatus—Campbellsport, Wis., is considering the purchase of apparatus.

Norristown, Pa., Rjects Bids—All bids for supplying fire apparatus for Norristown, Pa., have been rejected.

Hillsboro, Ohio, to Issue Bonds—Hillsboro, Ohio, is to issue $13,500 bonds to finance the purchase of fire apparatus.

Malden, Mass., Has Salvage Car—The fire department of Malden, Mass., has a completely equipped salvage car.

Weymouth, Mass., to Buy Pumper—Weymouth, Mass., voted to purchase a 750-gallon pumper.

St. Paul to Have New Station—Contracts have been awarded for the construction of a new station that will serve St. Paul, Minn. The house is to cost $23,000.

Baldwin, N. Y., to Get New Pumpers—Baldwin, N. Y., is to receive three new pumpers, instead of two as originally planned.

Parkersburg, W. Va., to Issue Bonds—Parkersburg, W. Va., is considering floating a bond issue to provide for additional fire department equipment.

San Martin, Cal., Considers Protection—Plans are being made in San Martin, Cal., to raise funds for fire protection equipment.

San Francisco Orders Squad Wagon—A new squad wagon equipped with life-saving apparatus has been ordered by San Francisco, Cal.

Derby, Conn., to Buy Pumper—After a deadlock of almost one year's duration, Derby, Conn., has purchased pumper, to be delivered within sixty days.

New Wilmington, Pa., May Buy Apparatus—Volunteer firemen of the borough of New Wilmington, Pa., are urging the purchase of fire apparatus.

N. Hollywood, Cal., Needs Apparatus—A recent fire in North Hollywood, Cal., demonstrated the need for additional fire apparatus to handle a fire that may come in while fighting another.

Pacific Palisades Plans Fire Alarm System—Pacific Palisades, Cal., is planning the installation of a fire alarm system. The plan is to substitute a call box system for the present telephone system.

N. Y. State Buys Apparatus—Five motor operated pumpers have been purchased by the State Conservation Commission of New York. With the new order, the department will have a total of fifty-seven pumpers.

Fairfield, Conn., to Buy Pumper—Fairfield, Conn., has invited bids for supplying a combination pumper and hose wagon. The apparatus is also to be equipped with a booster pump.

Poultney, Vt., Loses Apparatus—Fire apparatus of the village of Poultney, Vt., was destroyed by a blaze which leveled the two-story building containing the chemical and hose truck.

Aid Called to Fight Hotel Fire—The LaFrance Hotel in Burlington, Vt., was destroyed by fire. Aid was rushed from Winooski, Essex Junction, and Fort Ethan Allen. The loss was $200,000.

Wynantskill, N. Y., Has Housing—Chief Cornelius A. Casey of Troy, N. Y., and three hundred neighboring firemen attended the housewarming party at the headquarters of Wynantskill, N. Y. There were refreshments and dancing.

Bridgeport, Pa., to Purchase Apparatus—The intended purchase of fire apparatus for Bridgeport, Pa., has been delayed until some time in January. A 750-gallon pumper is to be secured.

Oskaloosa, Ia., to Answer Rural Alarms—The Council of Oskaloosa, Ia., made an official statement denying that it was the intention to stop giving outside aid. The apparatus will continue to answer rural calls.

Grocery Firm Sued for Fire Loss—A jury has awarded damages of $14,636 to a contracting firm which brought suit against the Great Atlantic and Pacific Tea Company for negligent use of an incinerator that was blamed for a fire that destroyed two sheds in Portland, Me.

Brunswick, Me., Holds Annual Banquet—Chief William B. Edwards was the principal speaker at the annual banquet of the Brunswick, Me., fire department, December 2. The guests included Fire Commissioners Thomas J. McMahon and George Drapeau.

Henry Ford Buys Hand Engine—An agent of Henry Ford visited Haverhill, Mass., recently and purchased an old hand tub and the old Hayden Rowe steam fire engine. The objects will be placed in the Ford Museum of Antiquities in Detroit.

North Wales, Pa., Firemen Win—Officials of North Wales, Pa., lost their fight to prevent the establishment of a volunteer fire company in addition to the paid department that is already funcioning. The court granted a charter to the volunteer company.

Firemen Thrown Off Apparatus—Two firemen of the Clementon, Pa., fire department were injured when the driver was forced to swerve upon the sidewalk to avoid a collision while on the way to a fire. The men were thrown from the machine by the jolt.

Better Protection Urged for Mansfield—Additional fire apparatus has been urged by the National Board of Fire Underwriters for Mansfield, Ohio. The report stressed that no men have been added to the department although the city limits have been extended.

Syracuse, N. Y., Awards Contracts—Syracuse, N. Y., has awarded contracts for two Seagrave pumpers and a Seagrave aerial ladder. There is a taxpayer's suit pending and it is possible that fulfillment of the contract awarded may be halted.

Sioux City to Abandon Shingle Roofs—An ordinance is being planned in Sioux City, Ia., that would gradually do away with the wooden shingle roof hazard. The proposed law would provide that all new buildings have composition roofs and that all wooden shingle roofs be replaced as fast as decay makes such a step necessary.

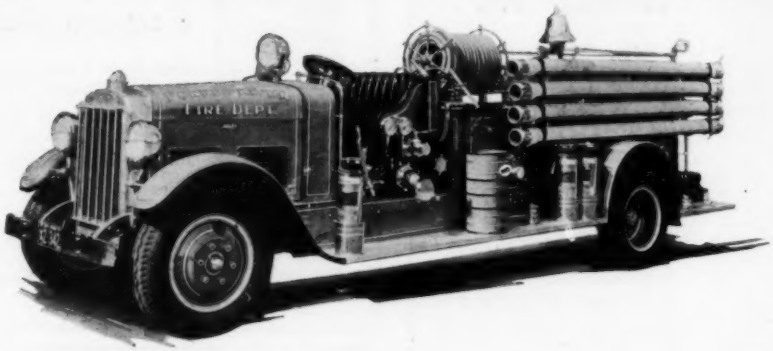
Ammonia Regulations Urged by Firemen—At a meeting of the Central Washington Firemen's Association held in Yakima, Wash., the members went on record as favoring regulations for ammonia tanks for storage and packing plants. Chief H. E. Hawkins was asked to draft an ordinance that would later be presented before the various city councils.

Creston, Ia., Firemen Have Toys For All—Through the help of the Creston, Ia., Fire Department, there were toys for all the children in the community. Old and discarded toys were made to look like new again, and Boy Scouts assisted in the distribution of the gifts to homes recommended by charitable organizations.

Court to Decide Department Difference—Unable to agree over the purchase of a fire engine, Paulsboro Council and the Billingsport Fire Association are taking their difference into the New Jersey Supreme Court. The council has threatened to form a new fire company and give it the equipment of the present unit.

Residents Against Restricted Runs—There has been some opposition to the plan followed by Willoughby Township, Ohio, limiting the fire apparatus to runs within the corporate limits. The mayor refused to permit the firemen to work at a fire one and one-half miles outside of the limits. As a result, the house was destroyed.

Sioux City Abandons Station Plans—Sioux City, Ia., has abandoned plans to erect a bungalow fire station, and a warrant to pay for the property required was cancelled. The city is considering the construction of a building to cost about $6,000, which later could be sold for residential purposes should the city find it necessary to change the location of the station.



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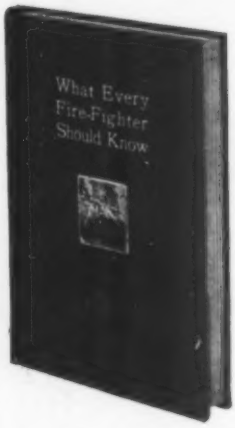

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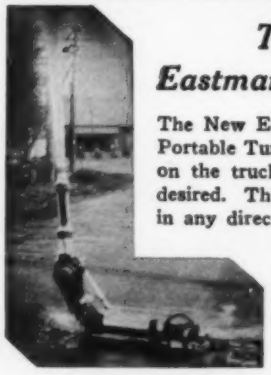

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PROPOSED IMPROVEMENTS

Bartlesville, Washington Co., Okla.—Reports state city to invite bids for furnishing additional equipment to the fire department in the near future. Estimated cost $20,000.

Troy, Rensselaer Co., N. Y.—Reports state city officials considering two sites for proposed new Stanton Steamer House for Pumper 6.

Paterson, Passaic Co., N. J.—At meeting of Board of Finance to be held Jan. 8 the purchase of a new pumper for the Riverside section of Paterson is to be considered. Estimated cost $13,500.

Longport, Atlantic Co., N. J.—Fire Chief C. L. Frye recommended the need of a modern fire and police alarm system to Borough Committee.

Denver, Denver Co., Colo.—An appropriation of $12,000 is included in the 1930 budget for construction of a new fire station in Barnum.

Newell, Hancock Co., W. Va.—Reports state funds are being raised for purchase of new fire equipment.

Bayfield, La Plata Co., Colo.—Town is raising funds to purchase new fire apparatus, according to reports.

Keokuk, Lee Co., Iowa—City calling for bids for furnishing a hook and ladder truck for the fire department, according to reports.

Rochelle Park, Bergen Co., N. J.—Ordinance was passed on final reading providing for the purchase of a 500 gal. Buffalo pumper and Buffalo hook and ladder truck, according to reports.

Johnson City, Broome Co., N. Y.—At recent mass meeting of residents of section of Union township lying north and northwest of Johnson City a proposal to form a fire district was met with unanimous approval. Petition to be presented to Union Township Board.

Cattaraugus, Cattaraugus Co., N. Y.—At recent election city voted in favor of a $3,300 bond issue for purchase of fire apparatus and equipment.

Glenside, Montgomery Co., Penn.—Glenside Fire Co. planning to erect a fire station in the near future. John Moser, Pres.

Children Die in Scotland Movie Fire

A wild panic that followed a fire in a motion picture theatre in Paisley, Scotland, is responsible for the death of seventy-two persons, mostly children between the ages of five and fourteen, and for injuries sustained by 150 others. The children were either suffocated or trampled on in the rush for exits, and many died at the foot of two main staircases leading from a balcony where the bodies of boys and girls were piled up. In this respect is was very similar to a motion picture fire in Montreal, Canada, January, 1927, where bodies were jammed up against the walls at the bottom of the balcony stairs.

The blaze started in the projection room and caused very little actual fire damage.

Many civilian rescuers mounted ladders, broke windows and dropped into the auditorium of the theatre where the children were lying in heaps. Emergency measures were tried to revive the victims. Local ambulance service could not cope with the abnormal condition, and tram cars were pressed into service.

Most of the children died in hospitals from internal injuries, and not from burns. The theatre had a capacity of 750 seats and the place was filled for a holiday showing of "The Crowd." When half of the picture had been shown, flames shot out from the projection room and disorder resulted. Luckily, there was little damage from fire. Otherwise, it is believed, the death list would have been much higher, because of possible asphyxiation.

Following an inspection of the theatre by a group of London experts, after the fire had occurred on New Year's day, the owner of the theatre was arrested and charged with homicide. The government is preparing a report so that the proper department can handle the necessary details.

When Parliament reassembles, the general matter of the safety of cinemas is to be raised, and many cities have started to tighten up on their regulations.

The King and Queen, Prime Minister Ramsay MacDonald, and other prominent officials of England, have sent telegrams and messages of condolence.

Ridgewood Plans Fire Alarm System—A new fire-alarm system is being planned to better serve Ridgewood, N. J.

Framingham, Mass, Chief on Trial—Over 1,000 persons attended a hearing of charges that Chief William Coulter, head of the Fire Department in Framingham, Mass, be removed. In the charges it was stated that the chief was unable to properly perform his duties. The chief's defense stated that the department head was only absent for 130 days because of an operation. The chief presented a petition signed by all but two members of the department, asking that he be retained.

New Type Protective Hat

A new light-weight, molded safety helmet has been placed on the market by the Mine Safety Appliance Company of Pittsburgh. It is designed to prevent head injuries from falling objects and is claimed to be adaptable for fire department work. The hat is absolutely waterproof, durable, well ventilated, and is made strong enough to withstand severe blows. The helmet is made in standard hat sizes.

It is equipped in front with an electric light, and a cable leads from the bulb to a battery carried on the side by means of a leather belt.

Protective Hat

New York to Improve Fire Alarm

The Board of Estimate has approved an expenditure of $221,381 for repairs and improvements to the fire alarm system in Brooklyn and Queens boroughs, New York City. The largest item was $140,000 for an extension to the underground fire alarm system in the Bushwick-Ridgewood district of Brooklyn and the installation of forty-one fire alarm test posts.

Work on the improvements will start early in the year. Additions to the Brooklyn central fire alarm station on Empire Boulevard were approved. Similar action was taken on the proposed extensions in the Greenpoint section.

Chief Danehy of Hopkinton, Dead

Chief Timothy J. Danehy, of the fire department of Hopkinton, Mass., died on December 21 at the age of fifty-six years after a lengthy illness at his home on Cedar Street.

He had been chief for the past fifteen years and had also served as a member of the board of selectmen. He was a member of the New England Association of Fire Chiefs, the Hopkinton Athletic Association, the Holy Name Society of St. John's Church and the Church Improvement Society.

HARRY BELKNAP.

Sioux City Opens Fire Station—A new fire station, costing $40,000, has been placed in service in Sioux City, Ia. Sixteen men operating on two shifts have been assigned to the new house. The new station takes the place of one that was erected thirty-eight years ago.

CONVENTION DATES

Jan. 18-19—SOUTHERN CALIFORNIA FIRE CHIEFS' CLUB. 3rd Annual Convention, Avalon, Catalina Island, Cal. Secretary-Treasurer, Chief G. E. Zimmerman, Coronado, Cal.

May 12, week of—NATIONAL FIRE PROTECTION ASSOCIATION. 34th Annual Meeting, Atlantic City, N. J. 1931 Convention probably to be held in Toronto, Can. Managing Director, Franklin H. Wentworth, 60 Batterymarch St., Boston, Mass.

May 14—DEL-MAR-VA. VOLUNTEER FIREMEN'S ASSOCIATION. 1st Annual Convention, Cambridge, Md. Secretary, J. Emory Parks, Cambridge, Md.

May 19-23—KANSAS STATE ASSOCIATION OF FIRE CHIEFS, STATE FIREMEN'S ASSOCIATION and FIRE SCHOOL. Respectively, 14th and 43rd Annual Convention and 2nd Annual Fire School, Salina, Kan. Secretary, Chief K. D. Doyle, Wamego, Kan. Secretary Firemen's Short Course Committee, E. J. Stewart, Kansas Insp. Bureau, 701 Jackson St., Topeka, Kan.

June—EASTERN ASSOCIATION OF FIRE CHIEFS. 3rd Annual Convention, Baltimore, Md. (Exact date to be decided later.)

June 2-6—AMERICAN WATER WORKS ASSOCIATION. 50th Annual Convention, Hotel Jefferson, St. Louis, Mo. Secretary, Beekman C. Little, Rochester, N. Y. Officers of the Association, 29 West 39th Street, New York City.

July 29-31—INDIANA FIREMEN'S ASSOCIATION. 13th Annual Convention, Lafayette Ind. Secretary, Clem Smith, Fire Headquarters, Terre Haute, Ind.

Sept. 2-4—KENTUCKY FIREMEN'S ASSOCIATION. 11th Annual Convention, Paducah, Ky. Secretary, Capt. S. G. Render, 940 Starks Bldg., Louisville, Ky.

Sept. 9-11—ILLINOIS FIREMEN'S ASSOCIATION. 43rd Annual Convention, Peoria, Ill. Secretary, Assistant Chief Roy W. Alsip, Fire Department, Champaign, Ill. Exhibits, Chief Albert Herring, Fire Department, Murphysboro, Ill.

Sept. 16-17—IOWA FIREMEN'S ASSOCIATION. 53rd Annual Convention, Boone, Ia. Secretary, Paul Soener, Independence, Ia.

Sept. 24-25—MISSOURI STATE FIREMEN'S ASSOCIATION. Annual Convention, Trenton, Mo. Secretary-treasurer, M. J. Mulvoy, 3500 S. Grand Boulevard, St. Louis.

FALSE ALARMS

LUCKY FELLOW

It's great how news travels in a fire house. In but a short time it became general gossip that Tom Gary had been turned down by three girls in succession.

When the man at the desk heard the story he said:

"Tom had better watch out, or his luck will change."

Rouge in haste and repaint at leisure.

ALL ALONE

The rookie was over in a corner polishing some brass work.

"That guy is in a class by himself," said one of the firemen.

"I don't see why. He looks normal."

"You don't understand. There is no drill school today, but he hasn't heard about it yet."

Our idea of a pessimist is the fellow who rinses out a fresh sanitary cup direct from its sanitary container, before using it.

PRIVACY WANTED

Jerry who had become accustomed to sleeping in dormitories on the night shift, married a girl who was very much a business executive, and off they went on their honeymoon. She had attended to most of the details.

When they entered the hotel room reserved for them at the end of their long trip, Jerry put on a long grin as he saw twin beds.

"What's the matter dear?" asked the attentive bride.

"Why, I certainly thought that we were going to have a room all to ourselves.

Next time there's a traffic jam, take note of the fact that the smallest and rustiest cars will be the first to honk their horns. The larger cars, carrying men of presumably more weight in the world of business, are comparatively calm and dignified. It's the little fellow who stirs up the rumpus.

A SURE TEST

Something went wrong with the fire alarm system, after a very heavy sleet storm. The power company suffered as well. Linemen were sent out to put the system into operating condition again. A lineman shouted to his helper:

"Hey Bill, grab hold of one of those wires."

"All right, I got one," answered Bill.

"Feel anything?"

"Nope."

"Good! I wasn't sure which was which. Don't touch the other one, it is a high tension power line."

A good education enables you to get into more intelligent trouble.

TRUE TO FORM

The watchman at the warehouse, who was very much Scotch, was surprised to see a dog running past the door with a fire pail tied to its tail. Following the dog, was a boy who was unlucky enough to be caught.

The watchman raised his hand as though to strike.

"I'll teach ye to tie a fire pail to the dog's tail."

"Aw, gee, mister, it wasn't your dog."

"No, it was'na my dog, but it was *my* fire pail."

It has been reported that invitations to Hollywood parties read: Admit bearer and one husband.

NEGOTIATIONS OFF

A group of men drove into the garage. One said, "There's just a little rattle in the fender. I'll leave the car here and come back for it in an hour."

And when the group returned, the garage mechanic said:

"Say, mister, I hate to tell ye, but that car of yours is a wreck. It needs new bushings, the valves stick, it's got to have a new timer, it should be rebored," etc., etc.

"I'm glad you told me," said the spokesman of the party, "'cause we were thinking of buying it and putting on a hose body. The man out in front told me to try out the car before I bought it, and he said to come back here in the shop and you'd take the rattle out of the fender before I took it out for a trial."

It's discouraging when you back and twist and turn and finally do get parked in a narrow space to find that you can't get the car door open because it bumps against a fire plug.

SAFETY FIRST

Following a sectional meeting, the men made a trip to New York to buy pretzels, and to do things that an out of town visitor generally does. They purchased seats for the first show they saw advertised. But they got lost in the traffic jam and arrived late at the theatre.

Presenting their tickets at the door, the ticket-tearer said:

"I'm sorry but I can't let you in yet."

"Why not?"

"It's the middle of the first act, and if I open that door, half of the audience might rush out."

You'll usually get credit for knowing what you are talking about if you'll just keep your mouth shut.

CANDID, ANYWAY

The commissioner presented all officers down to deputy chiefs with fountain pens for Christmas. He never knew how the gifts were appreciated, but if letters were in order he would probably have received a batch in the following manner:

"*Dear Commissioner:*

"I am writing with the fountain pen you sent me for Christmas, and only wish you were here so that I could tell you in person what I think of it. And since you have been handling pen for many years, perhaps you know of a good way to get ink stains off of clothing. My wife suggests salt and pumice. We all wish you would stop in and see us soon. You'd be surprised at the welcome you'll get.

"Respectfully yours,"

Three full-blooded Indians drank the anti-freeze solution from an automobile radiator in Minnesota and died immediately. The Indians haven't become accustomed to the white man's ways yet.

THE WRONG STAMP

A chief who had a most aggressive wife and who welcomed every opportunity to get away from the place he called home, told his wife that he had to attend a fire chief's meeting in Philadelphia. So that home ties would not be forgotten, he sent her a card. This arrived just as his wife was entertaining the lady next door.

"Here is a post card from my husband. He said he was going to Philadelphia but the card is post marked Boston."

"Goodness, what a careless post office," remarked the neighbor.

One secret of success is to go off where no one knows you and pretend that you amounted to something where you came from.

CLOSE ENOUGH

Joe Gerrity came downstairs very much disgruntled. He had been playing with the boys in what was marked on the architect's drawing: "Reading Room." Outside the station was the driver and so he vented his feelings.

"I came within an ace of winning the game."

"Well, why didn't you?"

"The other fellow had the ace."

The trouble with this country is that there's no longer an incentive to put your best foot forward. The brass rails are gone.

Our idea of the sweetness of revenge is a chiropractor giving an adjustment to the dentist who pulled the wrong tooth for him.

The way to prevent your friend from spending an hour in the bath tub while you are waiting to shave is to put tacks in the bath salts.

EFFICIENT . . . . because the Public is Educated to it

Nothing else will clear the densest traffic half so quickly as the notes of a siren. The motoring public knows instinctively that the streets must be cleared for the fire apparatus.

The Sterling No. 12 is a leader among sirens, built by siren specialists. Its shrill tones open a path for the chief's car or larger apparatus.

Enclosed high speed ball bearing motor; balanced 5" fan, micrometer clearances . . . complete with bracket, cord and switch . . . $45.00 f.o.b. Rochester, N. Y.

Write for Bulletin 660

STERING SIREN FIRE ALARM CO., INC.
61 Allen St. Rochester, N. Y.

Newest Designs ***Highest Quality***

Specializing in badges and insignia equipment for every fire department need, the EVERSON-ROSS line, known for its fine quality of materials and workmanship, offers a large, up-to-date selection to suit the most discriminating taste. Before you buy—

Write for our Fire Department Badge Catalog No. 32.

EVERSON-ROSS CO.
88 Chambers Street, New York

MATHEWS
(Reg. U. S. Pat. Off.)
FIRE HYDRANTS
for
DOMESTIC
and
HIGH PRESSURE Service

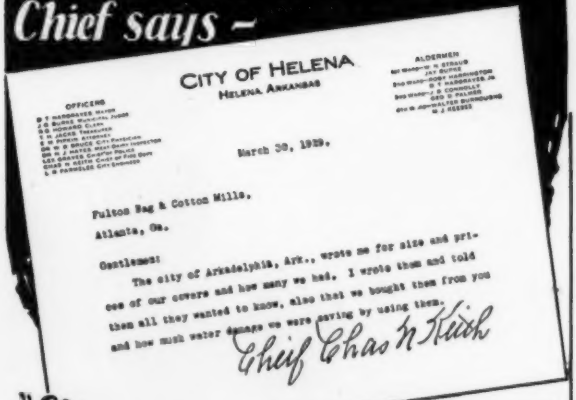
NOTE—
The positive waste value.
All operating threads are dry, being above the stuffing-box.
No toggles, no small, quick-wearing parts.
All moving parts are bronze or bronze-bushed.
The outside casing permits replacing a two-way standpipe with a steamer and two-way standpipe without digging up the ground.

An easily installed EXTENSION SECTION readily adapts them to new grade.

VALVES and BOXES
CAST IRON PIPE
Sand-Cast or "Sand-Spun"
FITTINGS

R. D. WOOD & CO., Phila., Pa.

Another Prominent Fire Chief says —



CITY OF HELENA
HELENA, ARKANSAS

March 30, 1929.

Fulton Bag & Cotton Mills,
Atlanta, Ga.

Gentlemen:
The city of Arkadelphia, Ark., wrote me for size and price of our covers and how many we had. I wrote them and told them all they wanted to know, also that we bought them from you and how much water damage we were saving by using them.

Chief Chas N Kirk

"Shuredry" Waterproofed SALVAGE COVERS

More evidence of the importance of "Shuredry" Salvage Covers to every Fire Department, no matter where located.

Not only do Shuredry Covers cost less than rubber, they are much easier to handle and spread, and do not peel or crack when folded and stored.

Write our nearest plant for samples and prices.

Fulton Bag & Cotton Mills
Brooklyn Dallas St. Louis Minneapolis
New Orleans Atlanta, Ga. Kan. City, Kan.
Manufacturers Since 1870

Confession of Arson as Evidence

(*Continued from page* 10)

284, testimony was introduced showing that a fireman who suffered a paralytic condition was 62 years of age and for 20 years had been a volunteer fireman in the Coleraine fire department. During the noon hour of May 9th he answered a fire alarm, ran as rapidly as he could 350 feet to the fire hall, hurriedly put on his fire-fighting equipment, mounted on the rear end of the hose truck, the place usually occupied by him on such occasions, and rode a distance of less than a block. As a part of his customary duties, upon reaching the proper location, he dropped off backward from the moving truck, holding one end of the hose for the purpose of snubbing it about the hydrant, while the moving truck continued to run out the hose. In thus leaving the truck, he misjudged the speed at which it was going and came down to the pavement stiff-legged, receiving a jar. He felt hurt immediately upon striking the pavement, felt a sudden jerk, his eyes blurred, and his neck snapped down. He was nauseated and dizzy but, with some assistance, made the hydrant connection. He reported his condition to the Chief of the Fire Department and was told to go easy. While at the fire he also assisted in replacing two sections of hose that had burst, working as rapidly as possible. He was at the fire about an hour, then returned to his home, feeling a numbness and weakness, and had to support himself against the wall in going upstairs on his way to his rooms over his place of business. He lay down for about half an hour and, on trying to arise, found that his left side, arm and leg were paralyzed.

The doctor testified that he did not know whether or not the paralytic condition resulted from cerebral hemmorhage which may have been caused by the fireman jumping from the fire truck. However, the Court held the fireman entitled to compensation under the State Workmen's Compensation laws, stating the following important law:

"At the time he responded to the fire alarm, relator was feeling perfectly normal and he had never before had any trouble such as he described or any indication of it. . . . It will not do to place a literal interpretation upon a statement of the doctor that he could not tell exactly what relator was doing at the time the cerebral hemorrhage occurred. It is only reasonable to interpret the doctor's testimony as meaning that he could not tell the exact or even proximate instant or moment it happened. . . . Occurrence or time for months prior to the fire at which the accident (the hemorrhage) could have occurred. A determination to a mathematical certainty as to exactly when, during the performance of his duties as a fireman, the hemorrhage took place was not necessary. It would be unreasonable to expect it."

The Use of Foam by English Departments

The apparatus used for generating foam in London, England, is far different from equipment used in this country. There it consists of a special pump into which are placed two special powders in separate tanks. The tanks are filled with water and the fluid is delivered from the tanks through two pipe lines which converge into one nozzle.

Taxation Law to Create Firemen's Pension Fund is Invalid

Ordinarily, any law is void which imposes a tax for a private purpose. This is particularly true with respect to laws which impose taxation on insurance companies intended to raise money to benefit members of the fire department.

For illustration, in Lowry vs. City of Clarksdale, 122 So. 195, a State law provided that firemen's disability and pension fund shall be created and maintained by a tax on insurance premiums, and "the proceeds of such appropriation or tax levy, or both, as may be made by such city, all fines collected for violation of the fire ordinances of such city, and one per centum of the monthly salaries of each member of such fire department."

The higher Court promptly held this law void, saying:

"The guaranty of 'equal protection of the laws' . . . does not prohibit legislation which is limited either in the objects to which it is directed or by the territory within which it is to operate. It merely requires that all persons subject to such legislation shall be treated alike, under like circumstances and conditions, both in privileges conferred and liability imposed. It is not infringed by legislation which applies only to those persons falling within a specified class, if it applies alike to all persons within such class, and reasonable grounds exist for making a distinction between those who fall within such class and those who do not. . . . A classification for purposes of taxation must rest on some reasonable distinction . . . and a tax statute is void which contains classifications that are not based on any substantial difference or reason. While reasonable classification is permitted, such classification must be based upon some real and substantial distinction which bears a reasonable, just and proper relation to the objects sought to be accomplished, and this within the field of the subject-matter concerning which the classification is made, or, in other words, the classification and the object to be accomplished must be germane."

Fire Alarm Chiefs Hold Meeting

A two-day session of the Eastern Association Superintendents of Fire and Police Telegraph was held at the Hotel Blackstone, Woonsocket, R. I. The opening session was conducted by George H. Bowen of Boston, Secretary-Treasurer of the association.

Timothy C. O'Hearn, City Electrician, of Cambridge, read a paper on "Legal Responsibility of Fire Alarm Superintendents." Clarence E. Beach, Consulting Engineer of the Gamewell Company of Newton Upper Falls, spoke on "Contemplated Improvements in Fire Alarm Boxes."

A dinner was arranged for the evening. There was a round table discussion on the financial side of the fire alarm question.

George L. Pickett, Superintendent of the Fire Alarm System in Boston spoke on "The Scheme of Numbering Fire Alarm Boxes in Boston." There was a demonstration of the Possner fire alarm device.

The Woonsocket meeting was in charge of Joseph M. Lussier, Superintendent of the local fire alarm system. The February meeting of the association will be held in Meriden, Conn.

Robinson Speaker at Box 52 Meeting

The December meeting of the Box 52 Association of Boston was held in Arlington, Mass., where the members were the guests of Chief Daniel B. Tierney, of the Arlington Fire Department.

Visits were made to the Central Fire Station, Heights Station, and the Highland Station. At the latter house a joint meeting was held with the Middlesex County Fire Warden's Association. Addresses of welcome were delivered by Chief Tierney, Ex-Chief Walter Peirce, and city officials. Chief John W. O'Hearn, of Watertown, replied for the fire wardens and President P. Hildreth Parker for the Box 52 Association. A brief talk was given by Police Commissioner Herbert A. Wilson, of Boston, who is an honorary member of the Box 52 Association.

George Ernest Robinson, of 80 Federal Street, Boston, well known architect who specializes in fire house designs gave an illustrated address on "Fire Department Housing."

HARRY BELKNAP.

Poughkeepsie to Invite Fire Alarm Bids—Poughkeepsie, N. Y., is considering opening bids for the construction of a new fire alarm system.

St. Paul to Erect New Fire Station—Contracts have been awarded for the construction of a new fire station in St. Paul, Minn.

A.B.C. ROOF MANIFOLDS

2 - 3 - 4 way
4"-6"-8"-10"
inlets

A Worthy Member of the Famous A. B. C. Line of Fire Equipment

Trade Mark A·B·C Since 1900

Be sure to get prices from us before buying your next supply. Also when in need of fire hose, hose expanders, extinguishers, . . . or any type of fire department nozzles, hydrant connections, hydrant gates, hose valves, bronze fittings, siamese connections, wrenches and other tools, hose racks and reels, and other similar equipment.

Send Now for Catalogs!

The A. B. C. Fire Prevention Mfg. Company
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Novo Acid Jars & Holders

of every description stronger than lead and non-corrosive. Used by departments throughout the country.

Chemical Tanks and Lally Quick Opening and Self-packing Top for Chemical Tanks

Lally Improved Fire Hose Couplings, Fire Extinguishers and Charges, Fire Hose and Fire Department Supplies in General

Send for Complete Catalog

LALLY FIRE APPLIANCE CO.
Wilmington Brass Co., Wilmington, Del.

Waterous Rotary Pumps

Smooth Running — Quiet — Highly Efficient

DEPENDABLE

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FIRE DEPARTMENT LADDERS

Made from carefully selected, straight grain, well-seasoned Oregon Pine. Strong, dependable highly finished, well-equipped and ironed.

Write us when interested.

COMBINATION LADDER CO., INC.
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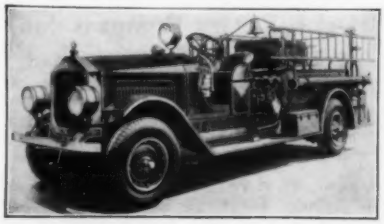
MAXIM FIRE APPARATUS

All Types



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BI-LATERAL FIRE HOSE

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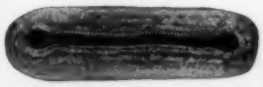

The only change made in constructing the rocker lug coupling is
1. That it must be made of the very highest grade metal composition.
2. Adding a little more of the bronze metal to each side of the pin lug so that the couplings will ride without catching.

If this is not an improvement, why?

The Bi-Lateral Fire Hose Co. is using the rocker lug coupling as standard equipment because it is better for the hose and makes a fire department more efficient.

Baker Fabric

A mass-woven jacket of exceptional pliability. The rubber lining is reinforced to flatten without breaks or pin holes. Write for details.

MANUFACTURED EXCLUSIVELY BY
HEWITT - GUTTA PERCHA RUBBER CORPORATION
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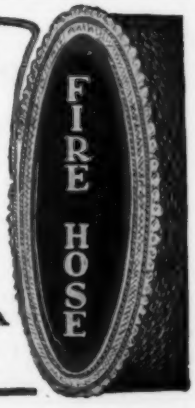
(Also makers of single and double jacket hose)



Saves time - *and costly hose*

No. 1. (Capacity 3 to 7 tons; weight, each, 72 lbs.)

No. 2. (Capacity 3 to 12 tons; weight, each, 118 lbs.)

Complete Information and Prices on request.

It's often necessary to move apparatus at a fire. Automobile traffic hates to be held up by a line of hose stretched across the right of way.

Why ruin your hose by driving over it? Or waste valuable time cutting off and disconnecting?

The Wausau Protector is a big time and money saver—easy to handle and carry. Order a set today, or write us for particulars.

Wausau Fire Hose Protector Co.
1520 Harmon Place, Minneapolis, Minn.

RENSSELAER "COREY" FIRE HYDRANTS

The **Corey** Fire Hydrants as built by us are the only **Genuine Corey Fire Hydrants** manufactured, and they conform to the standard specifications of the American Water Works Association.

Ask for Catalogue

RENSSELAER VALVE CO.,
TROY, N. Y.

Fire Fighting Equipment

The quality of Pirsch fire fighting equipment is assured by more than seventy years of manufacturing experience. The Pirsch line is complete, chemical engines, ladder trucks, pumpers and Pirsch trussed fire ladders. Write.

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Presses for Lining Service Pipe with Cement

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Hedberg Super Sirens

"The World's Best by Test"

offer the world's greatest and most versatile range of choice involving sizes and methods of operation.

Write for descriptive matter showing sirens that have never lost in competition.

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The High Efficiency of HALE Rotary Pumps is due to:

1 The form of the patented Rotor Tooth.
2 Automatic Packing.
3 Four bearing pump shafts.
4 Stainless steel pump shafts.

The design of Hale pumps has been perfected through fifteen years of active experience, and has resulted in a rugged, highly efficient product.

HALE FIRE PUMP CO., INC.
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New Victor Gas and Fume Mask

Better Rubber. Longer Life. Better Fitted. Moulded to Fit the Face. Better Vision. Renewable Lenses. Better Air. Better Work. Low Prices. High Quality.

Over 5,000 Victor Gas Masks in Service
Full Line Fire Dept. Supplies and Equipment
New 43 Edition Catalog on Request

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When in the Market for New Equipment

please write us and we shall be glad to have the right manufacturers provide you with complete specifications and prices for your consideration. This service won't cost a cent nor place you under any obligation whatever. We just want to cooperate both with you and with manufacturers in every possible way.

FIRE ENGINEERING
225 W. 34th St., N. Y. C.

Your Catalog Page

Fire Protection Equipment and Supplies

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This page is here to make it *convenient* for you to get complete specifications and prices from *reliable* manufacturers of equipment needed for your department. It is *your* page to use freely without any obligation.

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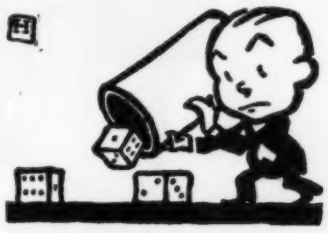

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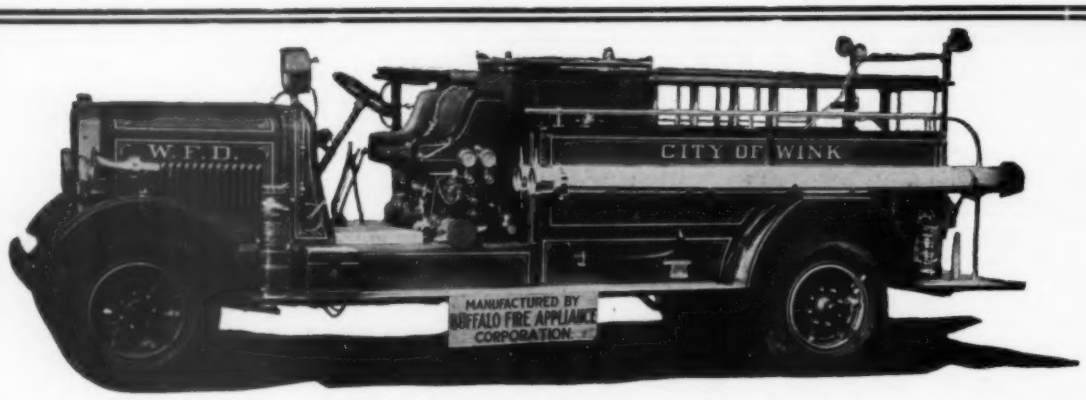

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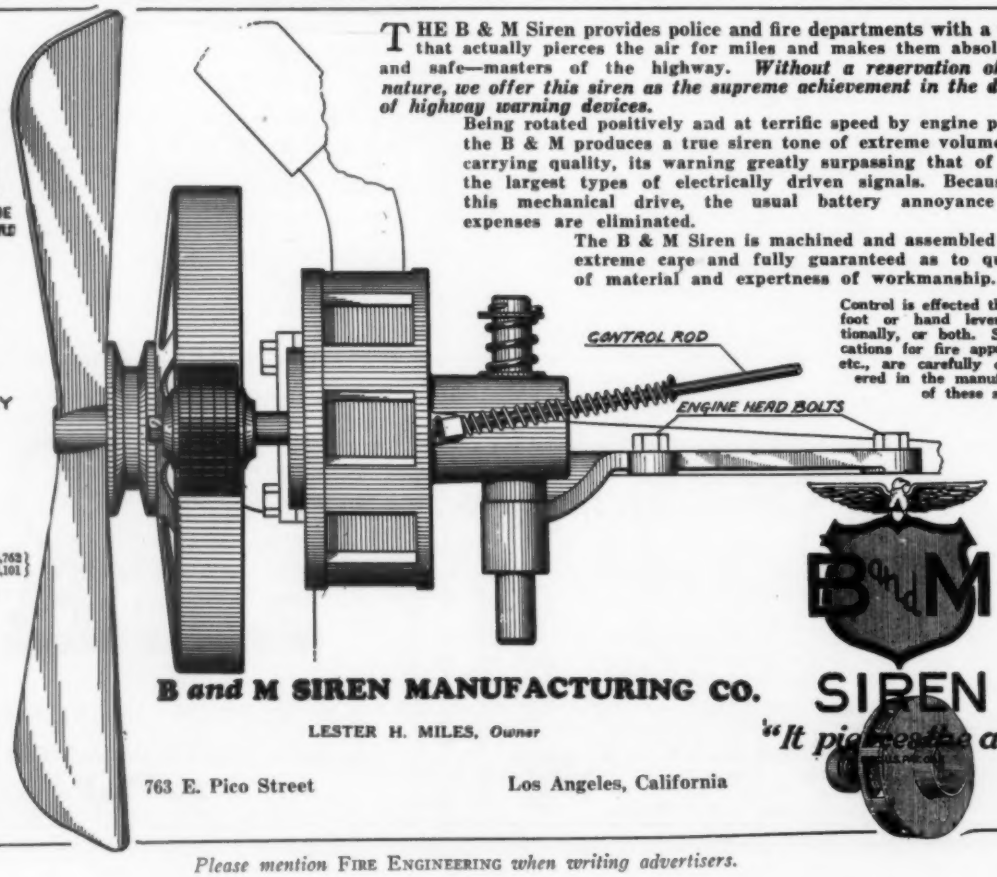

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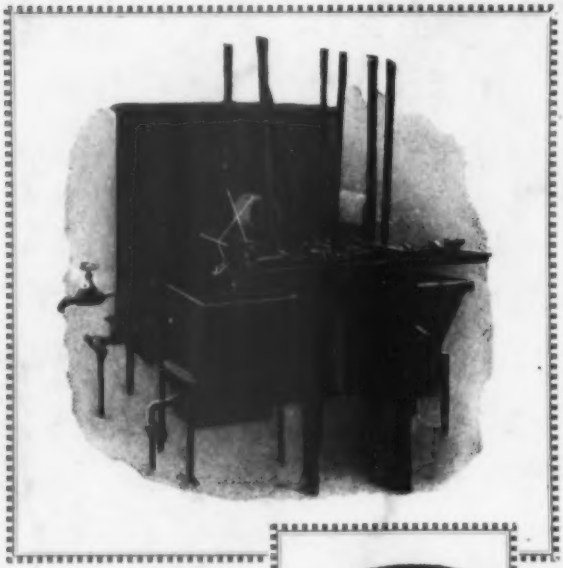

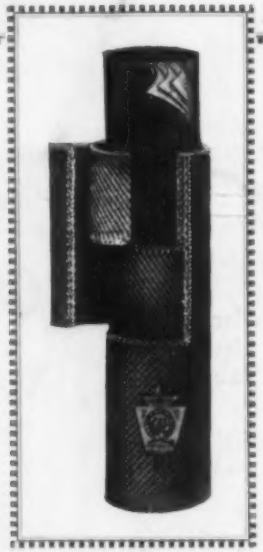

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